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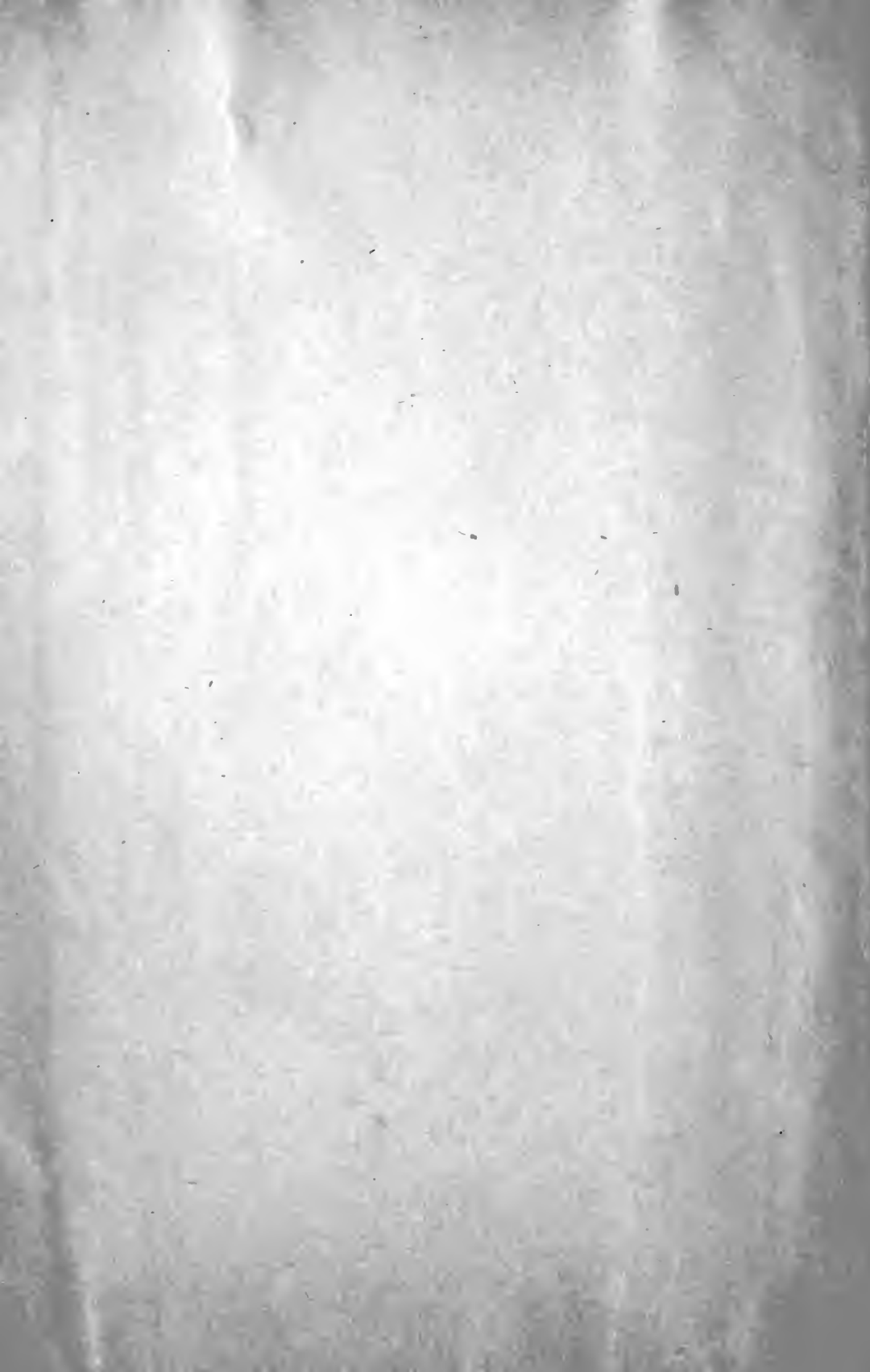
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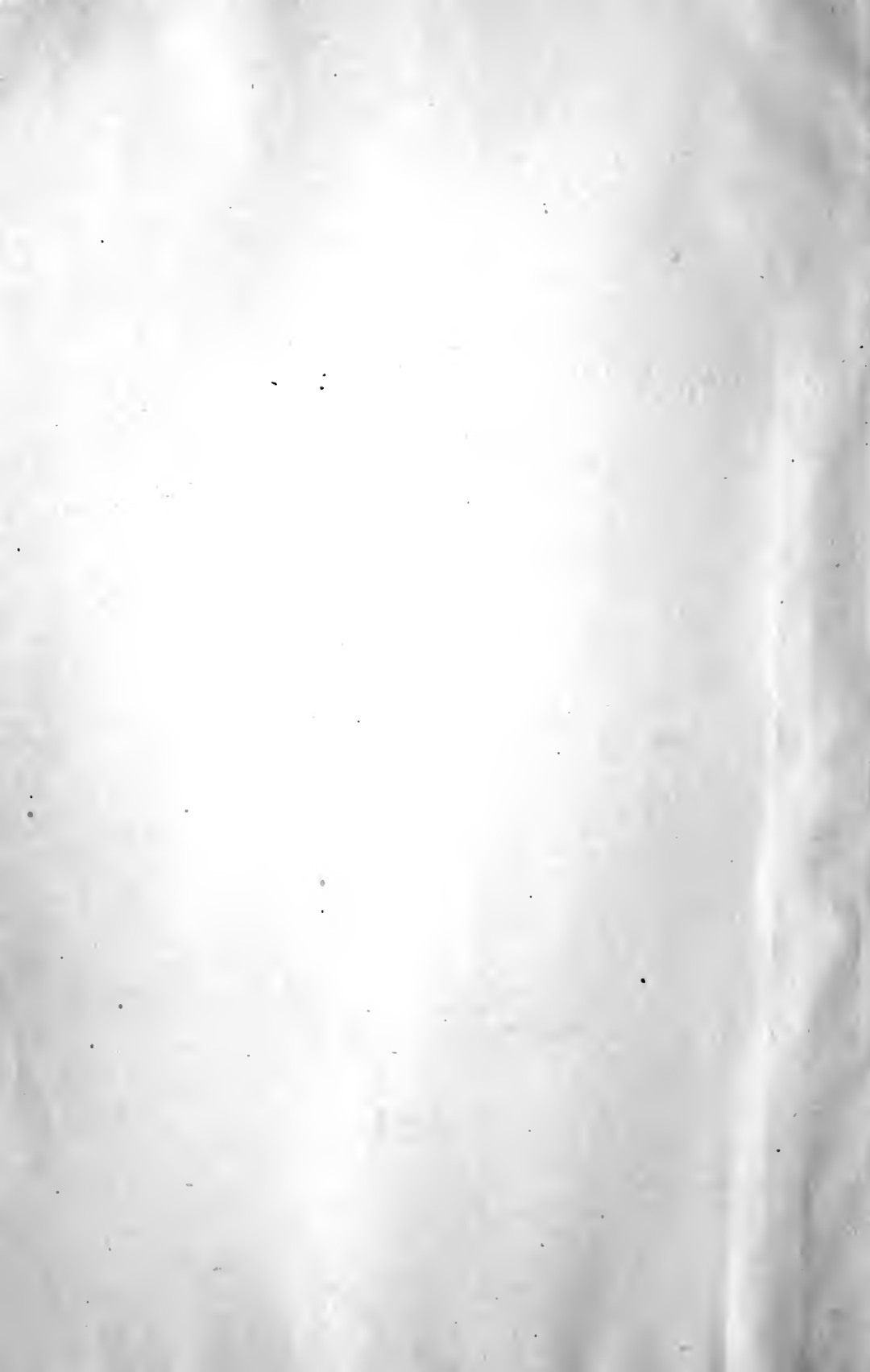


FIFTH ANNUAL REPORT
OF THE
PROVINCIAL BOARD OF HEALTH
OF ONTARIO,
BEING FOR THE YEAR 1886.

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FIFTH ANNUAL REPORT

OF THE

PROVINCIAL BOARD OF HEALTH.

TO HIS HONOUR THE HONOURABLE JOHN BEVERLEY ROBINSON,
Lieutenant-Governor of the Province of Ontario.

May it Please Your Honour :

The Provincial Board of Health begs leave to present this, its Fifth Annual Report. The appendices following the Report contain reports and investigations on the following subjects, that in relation to the health of the Province, have occupied the attention of the Board during the year 1886 :—

1. Annual Address of Chairman.
2. Health Notes of a Recent Tour in Great Britain, by the Chairman.
3. Report on the Ontario Vaccine Farm, to which is appended a summary of results of vaccine used in Ontario in 1885.
- ✓ 4. Abattoirs and Slaughter-houses ; Report on the Toronto Cattle Market.
5. Reports on the Construction and Management of Cheese Factories and Dairies.
6. Report of the Committee on Foods, Drinks, etc., regarding the sources of Ice Supply.
7. Reports of the Committee on Sewage, Drainage and Water Supply, on—
 - (a) Contemplated System of Sewerage for Stratford.
 - (b) “ “ “ Owen Sound.
 - (c) “ “ “ St. Catharines.
 - (d) “ “ “ Brockville.
 - (e) “ Trunk Sewer for Toronto.
 - (f) “ System of Water Supply for Cornwall.
8. Report of the Committee on Poisons, Explosives, Accidents, etc., etc., *re* Illuminating Gas.
9. Report of Delegate to the Canada Medical Association, on Quarantine and other matters.
10. Report of the Secretary on the Brantford Starch Factory Nuisance.
- ✓ 11. Annual Reports of Local Boards of Health.

The progress of Sanitation in our Province during the last year, we may fairly consider to have been satisfactory, and the good work done by the numerous Local Boards most encouraging, affording conclusive evidence of an increase of interest in the minds of the people on matters connected with public health. On the routine work of our Board it will be unnecessary to dilate, as the Secretary, in his report, will enter fully on the discussion of all matters that at the various quarterly and special meetings have occupied the attention of the members; but on a few points of great importance to the community at large, I purpose briefly commenting:—1st. On the establishment of a vaccine farm at Palmerston, under the supervision of the Board and subsidized by the Government, Dr. Stewart, of that town, being the Manager. The occasional but somewhat rare occurrence of death from smallpox after vaccination, erysipelas and cases of blood poisoning from the use of impure virus, have led to a distrust in the minds of many to the practise of vaccination, as the Medical Officers, during the epidemic of last year in the Province of Quebec, had, too frequently for success in stamping out the disease, occasion for observing. It therefore became the imperative duty of all State and Provincial Boards of Health to endeavour to provide for the area of country under their charge vaccine virus to which no possible suspicion could attach. In view of the great importance of convincing the public that every possible precaution against impurity should be insisted on, it was deemed by our Board that the frequent supervision by the Secretary and one of our members resident in the neighbourhood, and the *quasi* Government imprimatur, would be the most effectual step towards antagonizing a most disastrous prejudice. Entertaining this belief at a meeting of the Board, February 2nd, 1886, the following resolution, moved by Dr. Yeomans, seconded by Dr. Cassidy, was carried: "That this Board having received notification from Dr. Stewart, of Palmerston, of the establishment by him of a vaccine farm, that he has supplied medical men throughout the Province, and further has asked continued inspection of his farm and methods of procedure, therefore this Board recommend that the Government should provide for the continued, frequent and thorough inspection of this vaccine farm, or other vaccine farms that may hereafter be established, with the object of securing a supply of pure and reliable vaccine lymph, procurable within this Province; and that a copy of this resolution be transmitted to the Attorney-General." At the quarterly meeting in May, Dr. Bryce read his report on the inspection made of the Ontario Vaccine Farm at Palmerston, which report was received and adopted. On the following day, on motion of Dr. Yeomans, seconded by Dr. Cassidy, it was resolved, "That inasmuch as Dr. Stewart had fulfilled some of the conditions required by this Board for the supply of reliable vaccine virus for the Province, this Board would recommend the payment of \$250 out of the Government grant, also that the remainder be paid in quarterly instalments, Dr. Stewart continuing to fulfil the conditions laid down by this Board." Since the establishment of this vaccine farm the supply of virus required in our Province has been largely obtained from Dr. Stewart to the complete satisfaction—at least from any communications to our Board to the contrary—of all who have made use of it. By this establishment of a vaccine institution under Government surveillance, the members of the Board entertain the hope that the prejudice existing in the minds of too many for safety against the dreaded disease, Smallpox, by vaccination, may in time be dispelled and the use of the only effectual preventive universally had recourse to. At a special meeting of the Board convened on the 21st of April for the consideration of a proposed plan for greatly enlarging the cattle market, at the present time nearly in the heart of the city of Toronto, the centre of this trade, Dr. Bryce read a report he had been requested to prepare after viewing the site and the active building operations in the numerous streets surrounding. The report was adopted after discussion, in which there was a unanimity of opinion expressed that cattle markets in large and growing cities should be placed on lines of supplying and distributing railways, at such a distance from city boundaries as would insure freedom from all nuisance to the inhabitants of the outlying neighbourhood. By the establishment of an abattoir within the grounds of the cattle market the inhabitants of the city would escape the nuisance arising out of the numerous private slaughtering houses scattered around, the blood from many passing into the drains, while from others, with imperfect ventilation and want of drainage, a contamination of the air of the locality in which they are situated.

necessarily ensues. With an abattoir situated adjoining the cattle grounds the blood might be converted, without creating a nuisance, into a valuable manure. At the Edinburgh abattoir the amount received annually from blood has risen from between two hundred (£200) and four hundred and fifty pounds (£450) sterling, to from eight hundred (£800) to twelve hundred pounds (£1,200) sterling, by contract with a Manchester firm, who have erected extensive premises and apparatus for extracting from the blood the albumen used in calico printing and converting the clot into valuable manure. In connection with the establishment is a boiling house, where all meat unfit for human food is boiled down and destroyed. Mr. Strype, an English civil engineer, has demonstrated that blood may be converted into a manure without creating any nuisance, by a solution of hydrated sulphate of alumina; a fiftieth of this solution when added to the blood being quite sufficient to prevent offensive effluvia, and the resulting mixture of blood and sulphate of alumina can be dried for use in pans over a fire without nuisance resulting. The dried blood obtained is of high fertilizing value and contains nitrogenous matter equal to fourteen or fifteen per cent. of ammonia. Mr. Strype has this process extensively carried out at the *Saladeros*, or slaughter-houses, at Monte Video, and Buenos Ayres. This dried blood for manure realizes between six and seven pounds sterling per ton. As there are many diseases which render the flesh of animals unfit for human food, and as thorough practical knowledge of the physical appearances of the animals so suffering, and of the various kinds of animal food as free from objection, is comparatively rarely possessed by Officers of Health or Sanitary Inspectors, an experienced Veterinary Surgeon should decide on the freedom from disease of all animals brought to a cattle market.

At the quarterly meeting of the Board on October 11th, a large number of communications relating to recent outbreaks of diphtheria in different parts of the province were read by the Secretary, going to show an increasing prevalence of the disease in the Province. In consequence the Board went into Committee of the whole *re* preparing regulations for limiting the spread of diphtheria, and after due consideration reported the regulations for isolating cases of this disease to the Board, the very frequent outbreaks of diphtheria, with large attendant mortality reported to the Secretary, rendering enforced isolation in the dwelling when at all practicable, or otherwise at properly isolated buildings equally necessary, as in cases of smallpox or scarlet fever. For the former, vaccination and re-vaccination furnishes efficient protection, but for diphtheria and scarlet fever no reliable preventatives are known to the profession beyond pure drinking water and guarding against contamination of the soil with organic matter—not even these after exposure. Of impure water as a factor, the report of the late Dr. Elisha Harris on an epidemic of malignant diphtheria in Northern Vermont, is a most conclusive evidence. The ascertained cause was drinking from a brook containing dead animals. Dr. Harris states that more than half of the inhabitants, were attacked with the disease, sixteen per cent. were dead from this disease at the time of his visit; subsequently thirty per cent. of the cases were fatal. This occurred in a section where only one or two deaths, or in the whole township, eight or nine usually occur in the whole year; that is, where the annual death rate had been steadily from 14 to 17 per 1,000, it now, for the period of five weeks, from diphtheria alone, became 140 per 1,000 yearly rate; while in the district itself, had the same ratio of destruction continued for a year, none would have remained alive. (See Report of National Board of Health for 1879, page 274.)

Allowing that decomposing organic matter, present in the soil has not, as conclusively as its presence in water, been demonstrated as the direct factor in the autogenesis of diphtheria in Dr. Harris' report of the Vermont epidemic, it must by all sanitarians be conceded that the health-depressing influences of the emanations from impure soil must render all persons exposed to it much more susceptible of the specific contagion, when exposed, either as attendants on a case, or as inmates of the house. Professor Nettleship's letter, recently in the London *Times*, commented on in the *British Medical Journal* on the 6th of October, led to the Local Government Board sending Mr. Spear to report on this epidemic at West Cowes. With the consent of the medical attendants, he visited the cases in the town then under treatment, and saw, besides several other cases, seven well marked unequivocal cases of diphtheria in four different families, and was able to prove that

defective drainage and sewerage of the houses was at the bottom of the mischief. In the application of our Board for the same power to isolate diphtheria, that by the regulations of last year was conferred in cases of smallpox, we have a precedent in a similar application for isolation of diphtheria by the Metropolitan Asylums Board to the authorities of the Local Government Board, for permission to admit to their isolation hospitals persons suffering from this disease. Before deciding the point, the Local Government Board took council with the Royal College of Physicians as to whether persons suffering from diphtheria can be regarded as suffering from fever, within the meaning of section 69 of Metropolitan Poor Act. The opinion of the President, Sir William Jenner, was given as follows :

"If the words of the Act had been for patients suffering from 'fevers,' I should most certainly have considered diphtheria to be included under the term 'fever'; but the separation of smallpox from fevers seems to signify that the word 'fever' was intended to include only fevers of a special type, those cases, that is to say, to which the word 'fever' was specially applied, as scarlet fever, typhus fever and typhoid fever."

In these circumstances, the Local Government Board have decided that if diphtheria is to be admitted into isolation fever hospitals, there must be legislation sought, and have intimated to the Asylum managers that the question will receive their consideration. The Editor of the *British Medical Journal* remarks : "There was an important omission from Dr. Thorne's elaborate and very valuable report on the use and influence of hospitals for infectious diseases. He did not discuss at any length the extent to which such hospitals had been employed for the isolation of the different kinds of infectious diseases. It would have been most useful to know what results to the patients, and to the community at large, had followed the attempts at isolating in hospitals such diseases as diphtheria and enteric fever."

The burning question is, how perfect isolation and antisepticism are to be enforced, with unremitting vigilance, during the whole course of the disorder, for the good of the patient and protection of the community in the overcrowded houses of the working classes, and of people generally in poor circumstances, with small, badly ventilated rooms, and complete absence of every requisite for the perfect isolation of the patient and prevention of the spread of the disease to other members of the family. A good case in point was to-day related to me by one of my colleagues in Trinity Medical School. On Monday, the 29th of November, he was called to visit a child six years of age, but found it dead on arrival at the house ; learned that it had been taken ill with sore throat the previous Wednesday ; found the other children playing in the same room—a hot kitchen, with food uncovered, barrel of potatoes, etc., and a general state favourable to the reception of the *fomites* of the disease. The family consisted of father, mother, seven children, and seven boarders. Two other children were prostrated with the disease ; one child, aged twenty-one months, died the next day ; the other child, aged four years, he expected would quickly follow. Immediately on ascertaining the nature of the disease, he ordered the mother to remove the two children to an upper chamber, to have everything required handed to her through the partially open door, covered with a sheet, moistened frequently with a solution of corrosive sublimate, to allow no articles of food that had been in the sick room to be taken down stairs, to receive the sputa from the diseased mucous membrane on rags which were to be instantly burnt ; placed in two vessels a solution of corrosive sublimate, one for the reception of soiled clothing of patients, the other for the mother to bathe her hands after ministering to the children, and also gave strict injunctions to her to have no communication with other members of the family. On his return he found that the seven boarders had left for some other lodging house, and in view of the fact that they had been exposed to the infection from the Wednesday until the Doctor's arrival on Monday, the chances are that their garments, like the fabled ones of Nissus, will prove media of communicating the disease to other inmates of the new boarding-house they repaired to. Notwithstanding the strict injunctions to the mother to have no intercourse with other members of the family, he found they had been in a measure disregarded, and such will generally be the case when the medical attendant has, for want of better arrangements available, to attempt the work of isolation under such unfavourable circumstances. Had he been called on the Wednesday, the disease would

have been immediately diagnosed, and the work of separation and antisepticism immediately commenced. To have any chance for preventing the spread of this disease, we must have, first, immediate notification of the nature of the disease; second, perfect isolation of the attendant and patient; third, detention of all who have been exposed, whether inmates or visitors, until the period of incubation has elapsed. All these requisites, in the instance of wealthy or well-to-do people, are compatible with keeping the patient or patients in their own homes. A large, well ventilated room in the top story, and absolute exclusion of all but the nurse and medical attendant, with most rigid antiseptic measures, will suffice equally well with removal to an isolated hospital; but with the poor and struggling people, as this typical case illustrates, the effort must prove futile. The objection to removal is a purely sentimental one, and should not be allowed to weigh when the safety of the neighbouring community is concerned. The removal to a properly isolated, constructed and equipped building would tend, not only to a greater chance of recovery of patient or patients suffering from the disease in question, but also add immensely to the greater comfort and immunity from infection of the attendants on the sufferers. It is reasonable enough, under ordinary circumstances, for the owners of a dwelling to talk of their vested interests, of their house as a castle from which compulsory removal would be a violation of their undoubted rights; but when the castle contains that which may be compared to gunpowder or nitro-glycerine, which, if not carefully guarded against, would explode, to the great injury of the residents in the neighbourhood, then the Board contends that it is right and proper that the necessary legislation should be provided by which the people should be protected against sickness, suffering and death, as also the long train of evils as a necessary sequence involved.

The following Table will illustrate the prevalence of this Disease:—

YEAR.	Population.	—	Total No. of Deaths from Diphtheria.	Ratio to 1,000 of Population.
1882....	1,923,610	Province of Ontario.....	1,239	.64
1885....	1,923,610	“.....	1,006	.52
1886....	1,923,610	“.....	620 (to end of June)	.64
1884....	1,783,085	Massachusetts.....	1,084	.60
1885....	1,783,085	“.....	1,003	.51
1884....	.....	Cook Co., Illinois, of which Chicago is 14/17ths of population.	587	.68
1883....	.....	Minnesota.....	1,374	1.7

There can be no question that if, in the large proportion of these cases, where perfect isolation was impracticable, the patients had, on prompt notification of the nature of the disease, been removed to a properly adapted building for the prevention of its spread, a very great saving of life and property would have been effected. It would add very greatly to the chances of success in the effort the Provincial Board is making for the prevention of the spread of diphtheria, if all the Local Boards of Health in the Province would endorse that effort by petitioning the Government on the subject.

Another subject of great importance to be alluded to, is the persistence of cholera in various countries in Europe. It has already appeared in South America, and great fears are entertained in New Orleans and Galveston of its being imported from either Buenos Ayres, or Rosario, in the Argentine Republic, at both of which cities it would appear from recent accounts to be extensively prevailing. It is therefore most desirable that the experience in Spain of its most common mode of propagation through the water supply should be generally made known, more particularly as in our cities and many towns of Ontario, the disposal of *excreta* is by the water carriage system and the sewers the channels of discharge into streams, rivers or lakes. It therefore becomes a vital question whether the drinking-water supply, too frequently taken from the same source, may not become contaminated with the specific germ of the disease;

and best to accentuate this cause of danger, I extract from the *British Medical Journal* of October 9th, the following passages relating to the water supply and the prevalence of cholera in Spain. "In Madrid the sewage finds its way by open channels to the river Manzanares. Madrid suffered heavily from the disease in 1883, the number of cases at one time amounting to no fewer than 800 to 1,200 a day, at the time when new water works were completed but the water supply not available. In 1885 the whole number of cases was 2,207, and the deaths 1,366. The majority of the cases occurred in the houses along the course of the river Manzanares. On the Tagus, below Madrid, stands Aranjuez, and lower down Toledo, both take their drinking water supply from the river, and Aranjuez was more than decimated by cholera. But at Toledo the governor, with commendable promptitude, stopped the pumps and compelled the inhabitants to bring their water from a spring some miles away, and forbade them even to wash their clothes or bathe in the river. The hardship was greatly felt, but the city was saved from the disease.

Granada, Murcia and Valencia, furnished striking instances of the consequences of using water from sources contaminated by the poison of cholera.

"Granada is supplied with water from the rivers Genil and Darro, which irrigated the fertile plains on which the city stands, the canals by which it is brought to the town being uncovered and exposed to every kind of pollution. The Cholera broke out in July, spreading with fearful rapidity. In August the number of officially reported cases was 450 a day. By the middle of September the epidemic had exhausted itself, the total number of deaths having been, according to official reports, 5,903, though in reality far in excess of this number, some, indeed, maintaining that these figures should be doubled. At one time there were no fewer than 400 or 500 corpses lying piled up in the cemetery waiting interment. The course of the epidemic followed the rivers Genil and Darro wherever their waters were used for drinking purposes. A large mortality from other towns and cities occurred where the drinking water was contaminated." We thus see that the sanitary conditions of the various towns being nearly equally bad, made very little difference, the incidence of the disease being everywhere in direct relation to the water supply where, as in Seville, Malaga, Jerez and Madrid, the water was good, the disease was slight or even absent. Where the water supply was polluted by the choleraic excreta of the neighbouring population, the epidemic was severely felt; and most striking of all at Toledo, where the unsanitary conditions and filthy state of the town, at the best of times, could not but have been intensified by the deprivation of the usual water supply, the compulsory employment of a pure water, though scarcely more than was absolutely necessary for drinking purposes, had the effect of completely averting the pestilence. Filtration, such as it was, seems to have been of little use, but a pure supply, whether from springs or from mountain streams, was invariably successful. This experience of the mode of communication of the disease in Spain is in complete harmony with the demonstration of Dr. Snow in 1854, in the Bond street case, in which it was made apparent that the poison which causes Cholera is contained in the excreta of those suffering from the disease, and that if by leakage, soakage from cesspools or sewers, or by the reckless casting out on the ground of slops containing the infective matter, this may obtain access to wells and other sources of drinking water, and impart—as has been stated by Mr. Simon—to enormous volumes of water the power of propagating the disease. In no other way than this is it generally held that from Cholera patients can the disease be communicated, unless possibly it may be that, in very small and badly ventilated rooms, this organic poison having been disseminated in quantities through the atmosphere, may possibly be taken by the attendants into the system and from them again communicated. Professor Petenkoff holds that if this infectious matter, after leaving the body happens to pass into the ground, it may then, under peculiar conditions of soil, moisture and heat, undergo definite changes, and then rising as a miasm in the air poison those who have a predisposition to the disease. The conclusions arrived at in Bengal by Drs. Lewis and Cunningham incline to this view. These illustrations, however, of the media by which this formidable disease is propagated, are not furnished from any reasonable ground of apprehension that an epidemic of it is at all likely to occur in our Dominion; for even if, notwithstanding the very excellent marine sanitation to be found

from along the coast line from Galveston, Texas, to Portland, Maine, and on our coast from Halifax to Grosse Isle and Quebec, a few cases might escape the quarantine, and thus find entrance, they would, under the strict system of State and Provincial inland sanitation, be quickly stamped out. The only reason for adducing in this report the fearful statistics of the ravages of this pestilence in Spain, is to remind our Local Boards of Health that although a drinking water may by the analysis of scientific chemists be proven to be free from nitrates, nitrites, chlorides, ammonia, and but a trace of albuminoid ammonia, that when there is a question of the possibility of the presence of the specific germ of an infectious disease prevailing in the neighbourhood of the place where the public sewers have their outlet into stream, river, bay, or lake, then the question of the chance of the source of drinking-water supply being polluted by the access of these germs is one for serious consideration, and prompt attention to avoidance of such a cause of disease is indicated. It is clearly the paramount duty of Boards of Health, Provincial and Local, to give continuous and active attention to the causes of the diffusion of epidemic diseases, to combat the ideas that prevailed at the commencement of the present century, viz.: that ailments of every kind were more or less a portion of the necessary suffering of existence. Fortunately, however, for humanity, within the fifty years of the reign of Queen Victoria, within the same period of the noble life work of Dr. Bowditch, of Massachusetts, and of other illustrious explorers in the field of preventive medicine on the continent of Europe, the diseases long thought to be out of the range of medical inquiry as to first causes, have been in many instances traced, and by a gradual extension of correct knowledge, have been proven to be preventible, and the system of relieving mankind of its load of disease can no longer rest alone on curative medicine. Dr. Benjamin Ward Richardson very clearly expresses what should be the grand work of our era "to reconcile the two different schools; to systematise the preventive part of medical science so far as that is now known; to bring the preventive part in entire accord with the remedial or curative; to let the world at large understand the inter-relationships which exist between the two parts; and by a sympathy of action, based on knowledge, to enable every man and woman to assist in that part which tends towards prevention."

In an interesting and most useful address delivered by Captain Douglass Galton, on the opening of the one hundred and third session of the Society of Arts, November 17th, 1886, is most graphically portrayed the progress in the prevention of disease and general sanitation, during Her Majesty's reign. As the *Journal of the Society of Arts*, in which a striking description of the insanitary condition of the working people in Great Britain at the time Queen Victoria came to the throne, and their immensely improved state at the present time, is I apprehend, but sparsely circulated in our Province, I insert a few passages, at the same time recommending every Medical Health Officer and Local Board to procure a copy of the journal and make a careful study of the various tables contained in it: "The Queen's accession to the throne took place in June, 1837, and registration of births, deaths and marriages came into operation the following July, and thus the jubilee year of the Queen is the jubilee year of the registration of disease, supplying a basis of accurately observed facts, enabling the medical man to substitute numeric expressions for vague conjecture, and by affording the necessary data for ascertaining the prevalence and intensity of epidemics, has led to an examination of the existing causes of the diseases. This knowledge was the first step towards their prevention. Dr. Farr, in submitting the abstracts of death records for the first half year of registration between the 30th of June and 31st of December 1837, says: "It may be affirmed without great risk of exaggeration that it is possible to reduce the annual deaths in England and Wales by thirty thousand, and to increase the vigour, industry and wealth of the population, in an equal proportion, for diseases are the iron index of misery which recedes before strength, health and happiness, as the mortality declines." In 1837 it was calculated that one-tenth of the population of Manchester, and one-seventh of the population of Liverpool lived in cellars. The following is a description of a court in Manchester with its accompaniment of cellar accommodations. It was unpaved, down the middle a gutter found its way, every now and then forming pools in the holes with which the court abounded. Women from their doors tossed household

slopes of every description into the gutter, which ran into the nearest pool, which overflowed and stagnated. Steps down from this filthy court led down to the dwelling beneath. It was very dark inside. The window panes were broken and stopped with rags. The smell was so foul as almost to knock down the incomer. The children lay on the damp wet brick floor through which the stagnant moisture of the street oozed up. In many parts of London the dead were buried under over-crowded churches, chapels and churchyards. In 1845, a chapel in the immediate neighbourhood of Lincoln's-Inn-Fields was used as a school room in the day time, and a dancing saloon at night. In the cellars underneath the chapel ten thousand bodies had been interred in the seventeen years ending 1840; the burials were still continuing, and the old coffins were removed through a contiguous sewer to make room for new ones.

The rural districts were no better. (*See account by Sir H. Acland.*)

The village school was a room eleven feet by seven feet, where thirteen children were being taught lace making. They slept in a room eleven feet by twelve feet, the beds touching, so that there was no room to stand between them. Next door, a cottage occupied by three men, had as its only furniture, a log of wood to sit on; the bed-room was reached by a short ladder with six rungs, of which two were gone, the only bedding, some straw slept on until it was as small as chaff, the only bed clothes, some sacking.

The provision of pure water, and the disposal of the water after it had been fouled, had scarcely been thought about. In London, and in some large towns, water was provided by public companies, but in almost every country town the water was defective. Sir H. Acland describes the water supply of a village in Oxfordshire, some thirty five years ago, as a pit in the middle of a field, a quarter of a mile from the village, the sides of which were trodden down by cattle which went to drink and deposited the filth around. With regard to fecal matter, the general practice had been for each house to have its cesspit, which was emptied at intervals by night men, but in the poor districts, the soil was allowed by the occupiers to accumulate for years, to avoid the expense of emptying. When water closets were first introduced, the difficulties as to drainage, sewerage, and removal of refuse, were principally created by the absence of any legal machinery to enable the inhabitants to combine for sanitary purposes, and share the expenses necessary for improvements. Another important insanitary condition was caused by the fact, that the vagrant population of the kingdom resorted to common lodging houses, which were under no sort of supervision, and which were *foci* for the propagation of epidemic disease, as well as of moral depravity. The general conclusions at which the Poor Law Commissioners arrived in their report on the condition of the working classes were, that the disease originating in, or propagated by means of decomposing filth and refuse, damp, close and overcrowded dwellings, prevailed generally among the working classes of the kingdom, and that whilst these diseases could be abated by improved sanitary conditions, they were not removed by high wages and abundant food, if sanitary conditions were absent. They also pointed out that, owing to the defective water supply, cleanly habits were impossible. In illustration of the loss, caused to the nation by these preventible diseases, they mentioned that out of 43,000 widows, and 112,000 destitute orphans, relieved from the poor rates, the greater number had lost their husbands or fathers from preventible disease, and that the youthful population of either sex brought up in crowded, unwholesome dwellings, and under the adverse circumstances described, were deficient in physical strength and moral conduct, and grew up improvident, reckless and intemperate, caring for nothing but sensual gratification. The conditions required by these Commissioners for improving this insanitary state, were provision of drainage, removal of all *excreta* refuse from habitations, streets and roads, and improvement of water supply. They proposed the use of water carriage for *excreta* to be carried a distance from cities or towns; better supply of drinking water; that the expenses of public drainage and sewerage, improved means of cleansing would be a pecuniary gain by diminishing existing charges, attendant on sickness and premature death; that skilful engineers should be employed, to devise and construct new public works; to appoint in each district, specially qualified medical officers of health, to examine into the means necessary for prevention of disease, and to initiate sanitary measures, *i.e.* the removal of noxious, physical circumstances, and the promotion of civic, household and personal cleanliness, necessary for the improvement of the mora

condition of the population, for sound morality and refinement in manners and health are not long found co-existent with filthy habits amongst any class of the community. This report was one of the early fruits of the system of vital statistics, commenced under the auspices of the Queen, by the late eminent Dr. Farr, and the report drawn up by the veteran sanitarian, Mr. Edwin Chadwick, C. B. At the same time, in the large cities, private associations were formed to encourage cleanliness, by establishing public baths and wash-houses. These advances in sanitation were greatly promoted by a threatened epidemic of Cholera, the first epidemic of 1832 having had as a result 16,437 victims, and that in 1848, having nearly decimated the cities and towns of the lower Danube, it passed through Austria into Germany and Hanover. Hamburg was attacked on the 7th of September, and within three weeks it reached the shores of England, and first appeared in London on the 22nd of September, 1848. This epidemic continued in Great Britain until the 22nd of December, 1849. It attacked those towns and houses which afforded it the best inducements to visit them in their filth, decaying refuse, crowded and dirty population, bad water, damp, polluted sub-soil, or any other conditions leading to bad health. The total number of victims of this second epidemic was 53,293. The Government was then led to the conclusion that further and more efficient provisions ought to be made for improving the sanitary condition of cities and populous towns in England and Wales, and an Act was passed creating a General Board of Health, the main feature of which was, that when the Registrar General's returns showed that the number of deaths on an average of the preceding seven years exceeded twenty-three per 1,000, the General Board of Health were empowered to send an inspector to make a public enquiry as to the sewerage, drainage, water supply, burial grounds, number and sanitary condition of inhabitants, and local sanitary acts in force; also, as to natural drainage areas, existing local boundaries, and whether others might be advantageously adopted. The General Board was also empowered to create a system of local administration by Local Boards of Health, and these Local Boards had the power given them to appoint necessary officers, including medical officers, surveyors, and inspectors of nuisances; public sewers vested in their administration; all new houses to be approved by the surveyor, and before any new house was commenced the levels of the cellars and the position of the drains was to be appointed by the surveyor. Occupation of cellars as dwellings was prohibited, in addition a number of other matters provided for improved sanitation. In 1849-50 Sir Robert Rawlinson introduced the system of constructing sewers and drains in right lines from point to point, with lampholes, or manholes, at every change of direction or gradient. The subject of pollution of streams and rivers by the water carriage system, was repeatedly discussed, and, on this vexed question, Captain Douglas Galton is of the opinion that it may be safely assumed that the water supply, which is delivered pure into a town, need not be passed in a foul state into streams or rivers, and that precipitation of the solid parts in sewage, and passing the liquid through land are eminently fitted, when properly applied, to produce a purified effluent at a certain cost. Consequently, if certain conditions of population and of sewage were always observed, each district could be made self-contained in respect of its sewage, just as it can be in respect of its cemetery, and it is probably wiser to spend money raised by rates on removing the solid matter, filtering the liquid through land, and employing labour on the land to produce food to be sold, rather than to spend the rates in paying interest on a large capital expended for works necessary to convey the sewage to a distance where its value would be entirely lost. Dr. Farr, in his report to the Registrar General on the death causes of 1838, says: "The careful exclusion of all unnecessary animal and vegetable matter, the immediate removal of all residual products, and the dilution of inevitable exhalations. The dead should no longer be buried where they are surrounded by buildings or dwellings; non-wholesome manufactories should be excluded from populated districts, and there is no assuredly reason why thousands of cattle, sheep and pigs, animals of every kind, sometimes affected with epizootic diseases, should be gathered together in market places within cities."

Although in the housing of the working classes much remains to be done, we have results to show that much sanitary improvement has been achieved by reconstruction of drains, removal of sewage from the midst of the population, opening out thoroughfares so as to admit ventilation in crowded districts. The death rate in London in the five years,

1838-42, was 25.57 per 1,000. In the five years, 1880-84, it was 21.01 per 1,000; and the deaths from zymotic diseases which, in the decade 1841-50, had averaged annually 5.29 per 1,000, were reduced in the years 1881-84 to 3.4 per 1,000. If, however, we assume that there had been no change in sanitary conditions, and, therefore, that the death rate had gone on increasing, according to Dr. Farr's formula of increase, due to density of population, where sanitary conditions remain unchanged, the death rate of 1880-84 would have averaged 26.62 per 1,000; that is a saving of 5.61 per 1,000 effected by sanitary measures. If, on this basis, we compare the saving in life, which has resulted from sanitary improvements at different periods since 1838-42, we find that it amounted to an annual saving of 4,604 lives during 1860-70, of 13,929 lives annually during 1870-80, and of 21,847 lives annually between 1880-84. The death rate of England and Wales for 1838-42 was 22.07 per 1,000, that of 1880-84 was 19.62 per 1,000, and the deaths from zymotic diseases, which averaged 4.52 per 1,000 in the decade 1841-50 per 1,000, were reduced to 2.71 per 1,000 in the years 1880-84. The improvement in urban districts does not appear to have kept pace with that in rural districts, for, in Table E, it appears that whilst the deaths from zymotic diseases in certain urban districts have declined from 5.89 per 1,000 in the decade 1851-60 to, 5.12 per 1,000 in the decade 1871-80, the deaths from zymotic disease in rural districts in the same interval have declined from 2.77 to 1.67 per 1,000. In order to form an estimate of the saving of life due to sanitary measures, we may assume that sanitation remained in abeyance, and calculate what the death rate, according to Dr. Farr's formula, would have been in consequence of increased density of population, and compare that with the actual death rate; upon this assumption we find that the sanitary improvements only began to produce their effects after the cholera epidemic of 1848-49. In the decade 1841-50, indeed, it appears that the death rate was actually larger than that due to the increase of population. But in the following decade, the sanitary improvements began to produce their effects, and this effect has gradually increased. In the decade 1850-60 the annual average saving of lives in England and Wales from sanitary improvements was 7,789. In the decade 1860-70 it rose to 10,481. In the decade 1870-80 it was 48,433, and in the five years, 1880-84, the average annual number of lives saved by sanitary improvement has been 102,240. Captain Galton, at the conclusion of his lecture, which the Attorney-General in proposing a vote of thanks characterized as one of the best ever delivered before the society, thus speaks: "The changes which have taken place in the last fifty years in every branch of life, social, political and commercial, will make the reign of Queen Victoria ever stand out as an important historical epoch. In respect of sanitation he found that the old system designed to regulate the sanitary condition of the people in simpler times, for a small population no longer met the exigencies of our crowded cities and more complicated habits of life. H. R. H. The Prince Consort, was one of the early promoters of sanitary progress; he was always seeking what would improve the condition of the working classes, and he used his whole influence to push forward the movement for improving the health of the army. The present President of the Society of Arts, the Prince of Wales, has worthily followed in the footsteps of his father, having initiated and carried through with marked success the Exhibition of Health and Education, the Inventions Exhibition, and, lastly, this year, the Colonial Exhibition, which has helped to cement the feeling of brotherhood between us and our Colonial Empire. H. R. H. was also the active chairman of the Royal Commission on the Housing of the Working Classes. The Queen may have suffered much from private grief, and endured much from public cases, but on entering the jubilee year of her reign she will be able to feel that she has not laboured in vain. She may feel satisfaction at having increased, by added provinces, that legacy of empire which she received from her predecessors, but she will have the greater satisfaction of feeling that the provinces which she has added are the smallest part of the triumphs of her reign. Those triumphs are best summed up in the million of lives saved, the consequent vast amount of disease which has been avoided; the physical health which has been promoted, the education which has been developed. Indeed the chief feature of the Queen's beneficent reign has been the improvement that it has produced in the morality, the well-being, that is to say, the happiness, of her people."

The above extracts from this comprehensive address on what has been done in the past in the cause of increased sanitation in England, should stimulate provincial and local boards in this Dominion to make such continued efforts in the work of preventing the causation and spread of disease, that in the course of a few years we may be able to exhibit, as a direct result of enforcement of health laws, evidences of a diminished death rate in proportion to population fully equal to that which appears in Captain Galton's tables A, B, C, D and E. In this endeavour we are well assured that in the future, as in the past, we shall be aided in all reasonable requests for additional health legislation. The members of the Provincial Board of Health have always received at the hands of the members of the Ontario Cabinet, not only a patient and courteous hearing, but the Government have also manifested evidences of their desire to grant increased sanitary legislation whenever it could be made apparent to them that such was imperatively required. Our Board has also to acknowledge the attention given by the Dominion Government to defects pointed out by Dr. Rauch, in his survey of the quarantine stations from the Gulf of Mexico to Portland, Maine, to Halifax and Quebec; as also to those pointed out by Dr. Bryce, last summer; as existing at Grosse Isle—defects which, we are happy to learn from Dr. Montizambert, have been in large measure remedied. Imperfect sewerage and disposal of sewage, and contamination of drinking-water supply, are universally admitted to be the chief factors in epidemics of typhoid, diphtheria, and other infectious diseases. Involving, as such epidemics do generally, large outlays of money for the effective removal of the above causes of disease, such outlays and expenditures frequently prove an insuperable difficulty for Local Boards alone to dispose of. The importance, therefore, is made evident of all diseases, whether proceeding from impure water, or, as in the instance of small-pox, traceable to imported cases from other provinces, or from beyond sea, being immediately reported to the Provincial Board, in order that immediate notification of the appearance of such zymotic diseases, and of the extent to which they are prevailing should, as agreed upon by the various states and provinces, at the meeting of the National Conference of State Boards in Toronto in October last, be communicated to the various Provinces of our Dominion and States of the Union contiguous to our borders, and thus the avenues of travel may be in some measure protected. As this precaution was unanimously agreed upon at the meeting of the above Conference, it is to be hoped that the Medical Officers of Local Boards will invariably comply, and thus powerfully co-operate with the Provincial Board in its efforts at removing causes, or *ad interim*, limiting the spread of communicable disease.

From the very numerous Local Boards organized since the first establishment of the Provincial Board, most valuable advances in the work of general sanitation have been made, as shown by the very excellent reports of the Local Health Officers; and with great satisfaction at the increase of interest in the work of prevention of such diseases that are within the compass of self-help, we are able to announce that since the issue of our last report, the number of Local Boards of Health in our Province has been increased from 391 in 1884, and 570 in 1885 to 610 in 1886.

All of which is respectfully submitted,

CHAS. WM. COVERNTON, M.D.,

Chairman Provincial Board of Health.

REPORT OF THE SECRETARY.

To the Chairman and Members of the Provincial Board of Health:—

GENTLEMEN,—In presenting for your consideration a review of the Board's work during the year now closing, it is natural and proper that I should revert briefly to the position of the Province as regards its health relations at the time when this sanitary year may be said to have begun. In doing so, I cannot help contrasting the commencement of this year with that for which my last report addressed to you was prepared.

Referring to the commencement of the last report, I find myself saying:—"Never since its organization has the Board seen the new year begin with a dawn so ominous of coming evil and its rising sun so obscured with dark and gloomy clouds as did 1885."

On page 37 of the same report, written during this year, I find it stated in reference to the great Smallpox epidemic:—"As an evidence that the work has, however, been generally satisfactory, it is pleasing to be able to state that at the date on which this is being written, February 8th, 1886, there is not a single case of Smallpox in Ontario."

This statement regarding Smallpox can, I am thankful to say, be made with the same truthfulness at the present moment, and with the exception of hardly more than a single outbreak, might have been used at any time during the past ten months. When, in addition to this, I add that the past year has been practically free from any reports of the approach of that other dreaded epidemic disease, Cholera, your Board will appreciate the pleasure I have in recalling to your recollection the fact that your Committee on Epidemics has, during this, had a breathing space after its exhausting labors of last year. But this breathing space is, during an armistice, not a truce, with these foes to health, and it seems as if, in the history of our work, we are following the ordinary law as regards zymotic diseases, and hence it becomes us to observe the teachings of the old adage, "In peace prepare for war."

Taking a comprehensive survey of our work during this year, it will at once appear to you that our work has been, in a special and peculiar sense, of this kind. Victorious in last year's warfare, we have, while singing pæans with our fellow-soldiers from every corner of the continent in the great annual American Health Congress, been industriously laboring to maintain the ground gained, by strengthening our defences, both internal and along the coast, and have, if not going forth to foreign war, been impressing more soldiers into the service, completing our organization and improving both the drill and the weapons of our army.

In presenting, in a condensed form, as my report to you, and through you to the Minister of the Department a summary of work done during the year, I propose, for the sake of convenience, to submit it rather by classification of subjects than in any chronological order. Following this I desire, with your permission, to present to the public a *resumé* of some of the ends arrived at and work accomplished during the past semi-decade, which is the first five years of our existence as a Board, with the hope that the recognition by ourselves of "something attempted, something done," will impel us both to a fuller realization of our duties in the future and to a clearer appreciation of the opportunities we have of making the shadows fall less heavily here and there on the lives of our fellows through helping to ward off the attacks of death by teaching the laws of a higher, because of a more rational and healthful life, and of urging, through every means at our command, the more thorough enforcement of statutory enactments and of pressing for more precise legislation on those points, which, through experience, we have learned to be insufficient and ineffective.

These points presented, it will probably not be thought by you inopportune if I present a somewhat detailed study of Diphtheria, which, during the present year, more than any other of those zymotic diseases with which we have to deal so intimately, has been brought before us, and which has caused us to discuss somewhat fully those measures most likely to limit its spread, and to present regulations therefor to the Lieutenant-Governor in Council for approval.

I.—OUTBREAKS OF CONTAGIOUS DISEASES.

1. *Smallpox*.—As stated in the last pages of my last year's report on Smallpox, there were but two of the Board's Medical Inspectors remaining at the time of writing, February 8th, inspecting daily the trains running westward from Montreal. They were recalled late in February and the final act of the Montreal drama, as played by this Board, had drawn to a close. The effects of the epidemic did not wholly cease, however, at this time, as cases of Smallpox occurred as follows during several subsequent months in the counties bordering upon the Province of Quebec :—

SMALLPOX CASES CONNECTED WITH MONTREAL OUTBREAK.

March.....	South Plantagenet, Prescott and Russell.	cases, 6, deaths, 0
April.....	Huntly Township, Carleton County	“ 5, “ 0
.....	Ottawa, County Carleton	“ 7, “ 2
May.....	Kenyon, Glengary	“ 1, “ 0

Such, as far as I am aware, are the last cases traceable to the Montreal epidemic. With those included in last year's report, it may be estimated that, directly or indirectly from this centre, 150 cases occurred, with a total of some 22 deaths. In spite, therefore, of the many difficulties in preventing the entrance of Smallpox into these eastern townships bordering on Quebec, our laws, carried into effect by the Boards of Health and their officers, were found equal to the task of limiting the disease, in most instances, to the houses in which it broke out first.

With the commencement of ocean navigation *via* the St. Lawrence, and of the immigrant travel westward, the dangers usually attendant upon the influx of so many persons from many European countries, exposed throughout thousands of miles of travel, to possible sources of contagion both on sea and land, were again looked for. Several reports had reached the Board that cases had occurred on different ocean steamships arriving at Quebec and Montreal, and the necessity for the carrying out of strict quarantine inspection became once more apparent. Not having learned that any regulations, additional to those previously existing, were being enforced along the St. Lawrence, I arranged, with the sanction of the Chairman of the Board and the Minister of the Department, to visit the St. Lawrence stations early in June. The necessity for this became apparent the very day I started on the trip, as information had been received from Mr. James Beatty, Lake Traffic Superintendent C. P. R., to the effect that two cases of Smallpox had appeared at Owen Sound, being men from the crew of the steamer *Athabasca*. Having conferred with Mr. Beatty as to the measures to be taken under the circumstances, and having telegraphed instructions to the Medical Health Officer, Dr. A. Cameron, Owen Sound, the further conduct of the matter was left in the hands of the Chairman.

Having proceeded to Quebec and subsequently to Grosse Isle, I learned from Dr. F. Montizambert, Chief Quarantine Officer of the St. Lawrence, that Russian immigrants suffering from Smallpox had been landed at Grosse Isle about the 13th of May. Imagining that their fellow passengers might have passed on the way to Manitoba *via* Lake Superior, I at once wrote to Mr. Beatty for information on this point. He promptly replied that certain Russian immigrants had passed up the lakes on May 20th *per* S.S. *Athabasca*, and as I had learned that none of her crew were from Lower Canada, where Smallpox had been so prevalent, I at once connected the outbreak in the persons of two of the crew with these immigrants. To show that the contagion had been carried on this steamer either by persons, clothing or baggage, I was soon to have ample proof. On the 30th of June I received a telegram from Dr. J. Hamilton, Supervising Surgeon General U. S. Marine Hospital Service, and some days afterwards similar information from Dr. H. B. Baker, Secretary Michigan State Board of Health, that a man, named Montgomery had entered Michigan *via* Sault Ste. Marie and had taken sick with Smallpox at Stalwart, Chippewa County. I found later that he had gone from Harrison, Ont., to the Sault on the S.S. *Athabasca* of May 20th. Having further noticed the occurrence of a case of Smallpox about the same time in Woodlands, Man., and believing in its possible connection with the same Russian immigrants, I wrote for information to

the Deputy Minister of Agriculture, Winnipeg, Acton C. Burrows, Esq. He promptly replied, courteously forwarding, as soon as obtained, information to the effect that a Mrs. A. Church had arrived at Halifax on April 4th and had passed *via* C. P. R. direct to Winnipeg; that there had been no Smallpox at the place she left in England; that there had been none on the Allan S.S. *Parisian*, of which she was a passenger, but that she had remained at the Dominion Immigration Building in Winnipeg till about the end of May (five days, say, after the Russian immigrants must have reached there), and that within less than two weeks from the time she left the Immigration Building and had reached Woodlands, she was taken sick with Smallpox. I was further informed regarding cases of Smallpox in Norfolk County, Man., beginning in the person of a man, Donald McCuaig, from Chatham, who had arrived in Manitoba about the end of May. Evidence to the effect that he had gone up by the S.S. *Athabasca*, or had been in the Immigrant Building, has not been obtained. The matter had now become so interesting that I followed out any clue which might connect other cases with these immigrants and the S.S. *Athabasca*.

By newspaper reports I further learned that a family named Skein, Canadians from Manitoulin Island, had been taken sick with Smallpox in Dakota. I at once wrote to Dr. Francis, Manitowaning, for information regarding the route taken by this family. A kind answer containing the following facts was promptly received by me:—There had been no Smallpox on Manitoulin for a number of years, while this family, in going to Dakota, had first taken a local steamer to Owen Sound; thence they went northward by the C. P. R. steamer *Athabasca*, on the 20th of May. The time of their falling sick corresponded with the period during which they could have been exposed on the *Athabasca*. About this time a report came from Michigan that other cases of the disease had broken out in Wayne County and in Detroit. The information received also connects the Wayne County outbreak with the same Russian immigrants. It occurred in the person of a German immigrant, who had entered Michigan *via* the St. Lawrence and Ontario, between the 15th and 20th of May, and must therefore have travelled west, probably in the same car or stayed at the same immigrant sheds as did the aforementioned Russians. Cases in Illinois are also stated to have occurred about the same time in immigrants who had passed through Canada. The following particulars regarding these cases have been received. (*vide next page*.)

Having become convinced of the dangers to which the Province must be continually exposed, as only too well illustrated by the instance just given, it became apparent to me that the first point to be gained, if protection against the danger of the introduction of disease by immigrants was to be prevented, was to point out in a thorough manner the exact nature of the quarantine service at that time in operation, and by pointing out its deficiencies to better enable the Board, and through them the Government, to make such representations to the proper authorities as would best serve to promote reforms and improvements. This was done in my report to you of the quarantine system of the St. Lawrence, which you were good enough to approve of and adopt. The occurrence of these outbreaks of the disease along the line which has, and must still more, become the main avenue by which immigrants can reach the new lands both of Ontario and the Northwest, and the publication of the report on the quarantine system of the St. Lawrence, adopted by the Board, both had their influence in obtaining the passage by Order in Council, approved Aug. 5th, 1886, of new and stringent quarantine regulations which, with some exceptions, are such, if thoroughly carried out, as will materially lessen the dangers of the introduction to the Dominion of cases of Smallpox from abroad.* Certain

* QUARANTINE.

SUPPLEMENTARY REGULATIONS ISSUED FOR THE DOMINION.

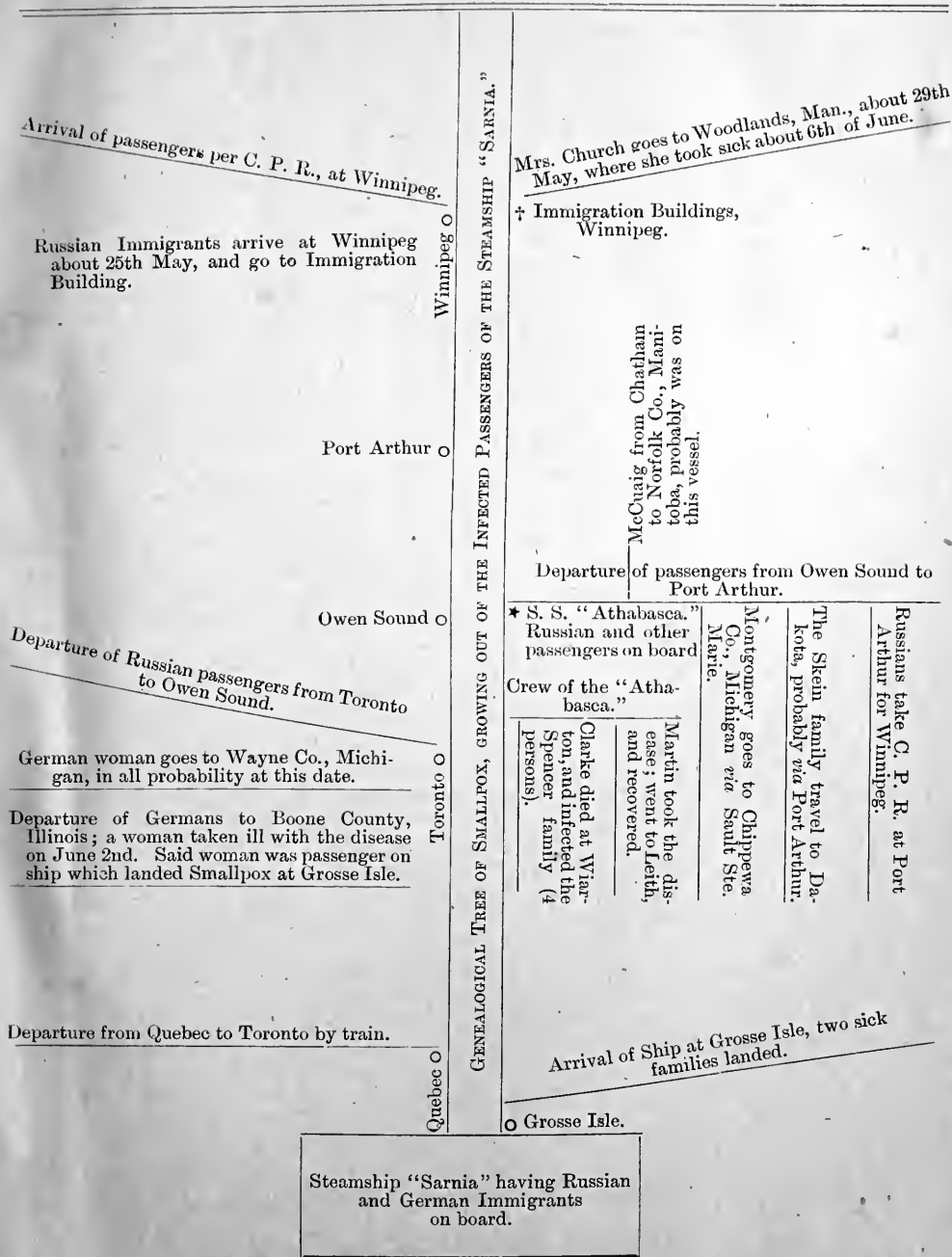
OTTAWA, August 7, 1886.

The following is the full text of the Order in Council providing for supplementary quarantine regulations:—

Whereas our Governor in Council, in view of the existence of the disease of Asiatic Cholera in parts of the Continent of Europe, and the disease of Smallpox in the United Kingdom, deems it advisable to adopt regulations to prevent the introduction of the same into Canada, and has been pleased to order that a-pro-

GENEALOGICAL TREE OF SMALLPOX GROWING OUT OF THE INFECTED PASSENGERS OF THE STEAMSHIP "SARNIA."

Summing up these various outbreaks, which may have owed their origin to certain Russian immigrants, some of whose fellow-countrymen and fellow-passengers had been left sick at Grosse Isle, and which, until further rebutting evidence is produced, we shall assume did owe their origin to said infective cause we have :—



delays occurred in the issue of the instructions to the pilots and quarantine officers, and as a consequence, I learned through official channels, that up to October but few vessels had complied with the regulations requiring them to report at Grosse Isle. Fortunately, the absence in unusually large degree of Smallpox in those European countries, from which most immigrants come to Canada, as well as the fewer arrivals in the later part of the season, have lessened the dangers incident to the imperfect carrying into operation of the new regulations; but if the Grosse Isle station is so equipped as to have a working staff for all the hours of the day, there can be no good reason why, with the recent addition of a steam yacht fitted up with all modern disinfecting appliances, the regulations should not next season be carried out without vexatious delays or loss to the shipping companies in any cases other than those where delay, through the presence of disease on board, is necessary and compulsory, and yet with a thoroughness compatible with the almost complete removal of probable dangers from this external source. It is to be hoped that the activity shown by the Department this year in these matters is indicative of an accelerated progress during the coming year.

clamation do issue putting in force the following regulations, supplementary to the quarantine regulations established by the proclamation of May twenty-third, in the year of Our Lord, one thousand eight hundred and sixty-eight, and January twenty-first, in the year of Our Lord, one thousand eight hundred and seventy-three, that is to say:—

FOR STEAMSHIPS AND SAILING VESSELS BY THE ST. LAWRENCE.

1. Every steamship and sailing vessel from any port outside of Canada coming to Canada by way of the St. Lawrence shall be inspected by a duly appointed Quarantine Medical Officer or officers before passing Grosse Isle, and shall not proceed or be allowed to proceed on her voyage until she receives a clean bill of health.

2. Each of the weekly steamships conveying Her Majesty's mails shall be met and inspected by a Quarantine Medical Officer at the Port of Rimouski, and a clean bill of health from such officer shall be equivalent to a clean bill of health granted by the Quarantine Officer at Grosse Isle, such mail vessels being amenable in all other respects to the quarantine regulations.

3. No passenger or any other person shall be allowed to land from any mail steamship at Rimouski until declared free from contagious disease by the quarantine medical officer.

4. Any person or persons ill with Cholera, Smallpox, or any other contagious disease, as defined in the quarantine regulations under the proclamation of May 23, 1868, shall be landed at Grosse Isle for treatment, and the vessel disinfected and allowed to proceed or be detained in such manner as may be deemed expedient by the medical superintendent for the protection of the public health, under the provisions of the said quarantine regulations.

5. No person shall be allowed to land from any steamship or sailing vessel without furnishing evidence to the satisfaction of the Quarantine Medical Officer of having been vaccinated within the seven previous years, nor any person not vaccinated to the satisfaction of the Quarantine Medical Officer.

6. Any unvaccinated person arriving at Rimouski or Grosse Isle shall be vaccinated by such Quarantine Medical Officer, or in the event of refusal shall be landed at Grosse Isle subject to a quarantine of observation.

7. The Quarantine Medical Officer at Grosse Isle or Rimouski shall examine any officer or surgeon or medical man of any steamship or sailing vessel, under oath, touching the state of health of such ship or vessel and of every person on board, in such form as shall be prescribed by the Minister of Agriculture.

8. Every steamship or sailing vessel arriving with infectious disease shall be liable to be detained at the quarantine station for disinfection, together with its cargo and passengers and crew, but every steamship or vessel provided with one isolated hospital for men, and another for women, on the upper deck, ventilated from above, and not by the door only, may, in the discretion of the Quarantine Medical Officer, if he is furnished with satisfactory evidence that such hospitals have been promptly and intelligently made use of, be allowed to proceed after the landing of the sick and the disinfection of such hospitals; any vessel, however, arriving with infectious disease, without having such special isolated and ventilated hospitals, shall be liable to be detained for disinfection at the quarantine station.

9. The master of every steamship or sailing vessel liable to quarantine shall produce a certificate of such inspection, and a clean bill of health, before being allowed to make a customs entry at the ports of Quebec and Montreal.

10. The inspecting physician at Quebec shall visit every steamship and sailing vessel from any port outside of Canada arriving at that port, and he shall send back to Grosse Isle any steamship or sailing vessel having on board contagious disease in contravention of the foregoing regulations.

FOR ALL OTHER ORGANIZED QUARANTINE PORTS OF THE DOMINION.

11. Every steam and sailing vessel from any port outside of Canada arriving at any regular organized quarantine ports (having quarantine stations), that is to say: At Halifax, Pictou, or Hawkesbury, or Sydney (Cape Breton), in the Province of Nova Scotia; or St. John, or the harbour of Miramichi, in the Province of New Brunswick; or Charlottetown, in the Province of Prince Edward Island; or Victoria, in the Province of British Columbia, shall be subject, in so far as they can be made to apply, to the foregoing regulations relating to Grosse Isle, as respects inspection, by the Quarantine Medical Officers of the said several ports or harbours, before being allowed to make a customs entry; and any vessel which it shall be considered necessary to detain shall be dealt with in accordance with the quarantine regulations of 1868, aforesaid.

With regard to the internal condition of the Province as regards preparedness for outbreaks of Smallpox, I can only say that in many municipalities it is everything that can be desired, the Local Boards being well organized and hospitals for possible cases being still in existence. Other municipalities, again, would seem to have become temporarily exhausted through the extraordinary efforts put forth by them during the panic of last autumn, and, like the vine-dressers who have escaped from the slopes during an eruption of Vesuvius, return, apparently unmindful of past danger, to a resumption of their deserted abodes, abandoned tasks and former habits. It was hoped by the Board that the Vaccination Act submitted to the Government at last session of Parliament, would have placed the Board in such a position as that it could, with much exactness, keep itself informed of municipal work in the direction of vaccinal protection of the new-born at least. In this it has been disappointed, for, although an improvement in the operation of the Vaccination Act of the Revised Statutes has been made as far as relates to the anomalous position previously occupied by Local Boards in the matter of enforcing vaccination, nevertheless the option of having the law carried out is still left, except during epidemics, wholly in the hands of the municipalities, with the usual result, that, only here and there, has any official attempt been made during the present year to carry out the law as relates to vaccination. Were the municipal health authorities active in the matter, a fair degree of protection to the general community might be expected to follow; but with the absence of any Act for enforcing a general provincial yearly vaccination, we shall expect, as we have been taught by past experience, that every year cases will here and there occur,

FOR ALL PORTS UNDER QUARANTINE DIRECTIONS OF COLLECTOR OF CUSTOMS.

12. At every other port in Canada, at which there is not a regularly organized quarantine station, and at which the Collector of Customs is authorized by the Act 35 Victoria, chapter 27, entitled "An Act relating to Quarantine," and the proclamation made in pursuance thereof, dated January 21, 1873, to act as quarantine officer for putting into effect such regulations, the Collector of Customs shall, in the case of any steamer or sailing vessel arriving from the Continent of Europe or the United Kingdom, cause a medical inspection to be made of any such vessel, and shall not grant a customs entry, except upon the production of a clean bill of health after such inspection.

13. In the event of any contagious disease being found on any steam or sailing vessel arriving at any port which is under quarantine direction of a Collector of Customs, such cases shall, in all respects, be dealt with in the manner prescribed in the quarantine regulations of January 21, 1873, aforesaid, applying to such ports, supplemented by the foregoing regulations in so far as they can be made to apply.

SIGNALS FOR SICKNESS TO BE DISPLAYED AT ALL PORTS.

14. Every steam or sailing vessel from a port outside of Canada having any contagious disease on board, shall, on arriving at any port in Canada, display a flag in the fore-shrouds, or a yellow flag at the fore, for a distinctive quarantine signal, in order to inform the Quarantine Officer, or Collector of Customs acting as such, that he is to receive the sick from such vessel, or to take such other steps with respect to such vessel as are prescribed by the quarantine regulations aforesaid, or requiring quarantine inspection at Grosse Isle.

HOW RAGS ARE TO BE DEALT WITH.

15. Rags shall not be allowed to land at any port in Canada, except at a port which is one of the regularly organized quarantine stations hereinbefore specified in section 11.

Rags shall not be allowed to enter or pass beyond the limits of the quarantine grounds until disinfected by such process or processes as shall be ordered by the Minister of Agriculture, or unless specially directed by the Quarantine Medical Officer.

The definitions in the proclamations of 1883 and 1884, respecting rags, continued in force by the Order in Council of October the 18th, 1884, are withdrawn.

HOURS OF INSPECTION.

16. The hours during which quarantine inspection, the mail steamships excepted, shall take place at any quarantine station or any port in Canada shall be between the hours of sunrise and sunset.

PENALTIES FOR PILOTS AND ALL OFFICERS AND MASTERS OF VESSELS.

17. Every pilot shall be furnished with printed copies of these regulations, one of which it shall be his duty to hand to the master of every steam and sailing vessel coming from a port outside of Canada, under a penalty not exceeding two hundred dollars.

18. Every Collector of Customs, officer or other person charged with putting into effect or having any duties in connection with the foregoing regulations shall be liable to a penalty not exceeding four hundred dollars and imprisonment until such penalty is paid for any contravention of such regulations, or for omission or neglect of duty in relation to them.

19. Every master of a steam or sailing vessel shall be liable to a penalty not exceeding four hundred dollars, and to imprisonment until such penalty is paid for any contravention of any of the foregoing regulations, and such vessel shall be held liable for any pecuniary penalty imposed on the master.

until another generation of unvaccinated children have grown, when an outbreak under favoring circumstances, as in Hungerford, will occur with the loss of many lives and the accompanying heavy financial expenditure. It is somewhat re-assuring, however, to know that almost everywhere the people have been so taught by the experiences of the last year or two, supported by stringent regulations, of how first cases can be quickly rendered harmless by isolation and early vaccination of those exposed, as that under ordinary conditions the disease is not likely for years to become a large factor in the mortality of the Province. This activity of Local Boards is a good evidence both of the appreciation of the good protective effects of isolation, and of acquiescence in the strict provisions of the statutory law and regulations in regard to the disease. It was so well illustrated in the instance of the health authorities of Owen Sound and of the several neighboring municipalities, into which the two cases of Smallpox from the *Athabasca* had passed, that I cannot do better than give here the report of Dr. Allan Cameron, Medical Health Officer, Owen Sound, as showing how the existence of our Boards, especially when there are Medical Health Officers, are the conditions of complete success in stamping out incipient epidemics of disease:—

(Copy of Report to Local Board of Health at Owen Sound.)

June 9th.—First heard rumor of Smallpox in Wiarton.

June 10th.—Report corroborated and on enquiry find that John Clarke, who had lately been employed on the steamer *Athabasca*, went from Owen Sound and died with the disease on the 9th inst. Also heard of a young man by the name of Wilson, a chum of Clarke's, and who was living in Owen Sound, is reported to be sick from Black Measles, but on enquiry find it not to be correct, as he is at present in good health.

June 11th.—Received telegram from Dr. Sloan to meet him at Leith that day (Friday.) On arriving we proceeded to the house of Peter Cameron and found a genuine case of confluent Smallpox in the seventh day of eruption on a young man, who had lately left employment on board steamer *Athabasca* and who was taken ill shortly after coming home. This evening (Friday) acquainted Mr. Taylor, station master, of the circumstances, who immediately telegraphed to Mr. Beattie, Manager of C. P. R. steamers. Also directed postmaster here to notify the postmaster of Leith, not to mix any mail matter from within infected house with the other contents of the mail bag.

June 12th.—Informed Detective Smith on his arrival of all the circumstances and in evening met Mr. Beattie. In obedience to a telegram from Dr. Bryce, I boarded the steamer *Atlantic* on her arrival this evening about 7 p.m. On inspection of the purser's book and from other information, I find the rumor of her having carried the sick man (Clarke) from the Sault Ste. Marie to Wiarton to be incorrect. After inspection of the crew, the boat was allowed to depart.

June 13th.—Ascertained to-day that the sick man Clarke was driven from the American hotel to the steamer *Pacific* on the 2nd of June. All those in the above hotel, who had not recently been vaccinated, complied to the number of twelve, and on the arrival of the steamer *Pacific* at 11:30 p.m., I presented telegram of Dr. Bryce's to Captain Campbell, who took advantage of the technical error in regard to name and defied me to detain him. The purser's list for the 2nd of June contains the name of George Clarke, point of departure, Owen Sound, destination was Wiarton. The Captain holds, that as his crew were passed for the American ports last fall, consequently all are vaccinated sufficiently. Finding that reasoning with the Captain was useless, I left and on going home, wrote a full statement to Dr. Bryce and had it forwarded by Detective Smith on morning train to be immediately delivered on his arrival in Toronto.

June 14th.—The steamer *Athabasca* arrived about 10:30 a.m.; found the passengers, who left the boat, looking well, with exception of one lady who had consumption. Inspection was made of the crew, forty-five in number, thirty-five of whom were vaccinated and the fore-castle was thoroughly fumigated with sulphurous acid gas. To-day I received the balance of 100 vaccine points, sent by order of Dr. Bryce from Dr. Stewart, of Palmerston.

June 15th.—Received letter from Dr. Covernton regarding the appointment by the Township of Keppel of a Medical Health Officer, which was immediately attended to by informing Mr. George Atkey of the request of the Provincial Board of Health.

June 16th.—Informed Dr. C. E. Barnhart of the rumor that four or five cases of Smallpox existed about six miles from Owen Sound, in the Township of Sarawak, said to have originated from a man by the name of McMillen, who left the steamer *Athabasca* at same time as the men from Leith and Wiarton.

June 19th.—Received postal card from Leith, dated 18th, reporting case improving. No new cases.

June 21st.—Postal card of date 19th June was received from Mr. C. V. Parke, stating that no new cases existed in Wiarton. On arrival of *Athabasca*, crew were overhauled and found some three men somewhat sick, apparently from vaccination. Six of the crew were revaccinated. Towards evening it is reported that two new cases had appeared at Leith, but as yet the report lacks corroboration.

June 28th.—Again visited steamer *Athabasca* on her third arrival and find her crew all healthy, with exception of a few sore arms. Proposed to Mr. Beattie the advisability of having immigrants pass inspection at Toronto, as the best safe-guard against a second outbreak.

Received word from Dr. Sloan, of Leith, in first week in August, stating the man Cameron had recovered entirely.

ALLAN CAMERON, M.D.

As will be seen by the following the captain of the *Pacific* was not allowed to continue his evasion of the law.

(Telegram to Dr. C. W. Covernton, Chairman Provincial Board of Health)

I have vaccinated officers and all hands on the *Pacific*.

COLLINGWOOD, Ont., June 16, 1886.

ALEXANDER R. STEPHENS, M.D.

Equally thorough to an extent beyond what by many might be deemed necessary were the measures taken in Wiarton, where the man Clarke from the *Athabasca* had gone, as given by Dr. R. M. Fisher, Medical Health Officer, and still more fully in the following letter of T. D. Galloway, Secretary of Board, and Sanitary Inspector, Wiarton.

P. H. BRYCE, Esq.,

WIARTON, 12th August, 1886.

Secretary Public Board of Health of Ontario, Toronto.

DEAR SIR,—I beg leave to ask you by return mail in regard to the following, that is to say: we have liberated our Smallpox patients and all is doing well. Have stamped the disease thoroughly out; but am afraid we are going to get into trouble with them for so long detention, but on the other hand we have supplied their wants with provisions and medical and other attendances. Still they appear not to be pleased for all. Are we bound to replace at the expense of this corporation all clothing and other domestic animals such as pigs, dogs, etc., that were burnt at the time of the death of the young man Clarke. We are getting in our bills for the medicine, provisions, etc., which will be very high. Also we burnt down a cow stable with the animals, also the clothing that was in the room where the young man Clarke died. We are to have a meeting of our Local Board of Health on Monday next, the 16th inst., and would like to have your answer to what I have asked from you so that you can guide us in settling with the parties on the best possible terms. From the conversation we have had with them since they got their liberty they are going to be a little ugly on our hands after all that our Board of Health has done for them. Let me have your reply before Monday if possible and oblige.

I am, your obedient servant,

T. D. GALLOWAY,

Secretary and Sanitary Inspector Local Board of Health, Wiarton.

2. *Scarlet Fever, Measles and Whooping Cough*.—Owing in part to the fact that these diseases are generally more or less prevalent in the Province, sometimes endemically and often as localized epidemics, and in part to the fact that we have not during the past year been in the habit of getting weekly returns of disease with any degree of regularity from reporters in different parts of the Province, I am not in a position to state to what degree, as compared with other years, these three diseases have been prevalent.

During the winter of 1885-86 reports from time to time showed that Measles was prevalent in many places. The fact of the nature of the disease being in most cases well known to many of our people, the wide prevalence of the old idea that it is better that children have the disease when young, and have it over as it were, as well as its comparative mildness as regards life, in those instances where care is taken and the sanitary surroundings are good, all tend to make attempts at limiting its spread in a community, on the part of health authorities generally, imperfect and perfunctory—if indeed they are made at all. The same statements may be made with reference to Whooping Cough. In addition to what has just been said regarding Measles, as relating to Whooping Cough, it may be again repeated as was remarked in last year's report, p. 53, 1885: "It would appear as if public sensibilities in regard to the dangers which may attach to the disease, will require to be greatly accentuated before it can be expected that the people of our communities will undertake the serious labour connected with the practical isolation from day to day for a succession of weeks, of any child or children in the houses affected with this disease. In the rural districts this would prove an easy matter, but in the thickly peopled streets of our cities the task, with the present sentiment on the matter, has too many practical difficulties for it to be expected that anything less than severe legal penalties could cause the law regarding its isolation to be enforced."

For whatever reason, the prevalence of Scarlet Fever, during the past several years, has, taken as a whole, been unusually small in this Province, while there can, I think, be but little doubt that owing to the general advance, both in the attention on the part of

the people to their sanitary surroundings and to the better attention to individual hygiene, as well as to the advance of medical science, the fatality from this disease in Ontario has been tending to growing yearly less. To illustrate this fact, as well as to point out what has been an axiom in Great Britain where, for many years accurate death registrations have existed, viz., that this, with other zymotic diseases, appears in cycles in epidemic form, in consequence of there having grown up in the meantime another generation of children unprotected against its ravages, I have examined the registrations in Ontario from 1871 to 1885, with the following results :

Table showing deaths from Scarlatina :—

Year.	Deaths.
1871.....	630
1872.....	642
1873)	
1874)	
1875)	300 (or below.)
1876)	
1877.....	717
1878)	
1879)	300 (or below.)
1880.....	409
1881.....	470
1882.....	543
1883.....	405
1884.....	382
1885.....	314

Thus we gather from the table that there was, in every returning semi-decade, an increase of deaths, as seen in 1871-2, in 1877, in 1882; but the returns so far for 1886 do not indicate any likelihood that 1887 will follow the law of previous fifth years.

The other fact mentioned is seen in the very decided decrease in deaths since 1877, for, although an increase as usual occurred in 1882, the total deaths during that year were only 543. A fact which will be more fully referred to in the paragraph on Diphtheria may be mentioned here, viz., that during the earlier years of the publication of death returns, Diphtheria did not appear amongst the ten highest causes of death in Ontario, and that not until 1876 do we find it advanced to this position. In 1877 both Diphtheria and Scarlet Fever are found amongst the ten highest causes of death, both being unusually high, 964 and 717 respectively. From this we would seem to have established the existence of that relationship so often claimed by physicians, were it not for the fact that in 1878, Diphtheria rose to 986, while Scarlet Fever dropped below 379. Whether, however, the more or less constant increase of Diphtheria in late years may in any way be connected with the almost yearly decrease of Scarlet Fever, will require further observation before any definite conclusion can be arrived at.

In view of these facts, apparently going to show that the disease is not virulent to the same extent as in many other countries, or as it was in this some years ago, it would seem not unnatural that less alarm should be felt and less activity shown in isolating the disease, on the part of Local Boards of Health, than is the case with Smallpox or Diphtheria. It will be gathered, however, from the following selected correspondence, that our Boards are made to feel, in some instances, that the eyes of an intelligent public are upon them, and that use will be made of the powers given to the people under the Health Acts to demand protection from these diseases when they break out :—

DR. P. H. BRYCE.

WINDSOR, ONT., June 9, 1886.

SIR,—In answer to your telegram of yesterday, I have the honour to inform you that there are three houses infected with scarlet fever in Walkerville, with the number of six patients; the houses are placarded and the Board of Health is endeavouring to cut short the spreading by strict isolation as far as the Board can carry its regulations. Enclosed please find the By-law passed April 10th, 1886, which will show you that the municipality is doing its duty.

Your's respectfully,

CHARLES E. CASGRAIN, M.D.

WINDSOR, June 7, 1886.

P. H. BRYCE, Esq.,
Secretary Provincial Board of Health, Toronto.

DEAR SIR,—Herewith I have the honour to place before you a resolution of the Windsor Board of Health passed on Saturday evening last.

Yours very truly,
 STEPHEN LUSTED,
 Secretary.

Copy of Resolution.

Moved by Dr. Coventry, seconded by Mr. M. A. McHugh, That on account of the prevalence of scarlet fever in Walkerville, the closing of the public school at that place in consequence thereof, and the absence of any adequate steps taken by the Municipal authorities of Sandwich East to guard against the spread of the disease, the Windsor Board of Education be requested to exclude from the schools of this town all children resident of Sandwich East (of which township Walkerville is a part), unless they, in each case, produce a certificate from a regular medical practitioner that they are free from scarlet fever and have not been exposed to that disease. Also, that this resolution be communicated to the Secretary of the Provincial Board of Health, with a request for the co-operation of that Board.

DR. BRYCE, Toronto.

ALMONTE, ONT., June 4, 1886.

DEAR SIR,—Our Municipal Council has been unable to get a Board of Health this year. They made some appointments, but the three ratepayers resigned and they found it impossible to get any one to act. I understand that you are Chairman of the Provincial Board of Health, and I would like to have some instructions what should be done in the matter. Scarlet fever is existing here, and I am afraid that it may spread, and if it does there is no Board of Health to attend to any epidemic. I should like to have a reply by return of mail.

Yours truly,
 A. M. GREIG,
 Mayor.

Dr. BRYCE,

Provincial Board of Health, Toronto.

ALMONTE, ONT., June 8, 1886.

DEAR SIR,—Your telegram duly received yesterday. We had a meeting of our Council last evening and I did not answer telegram, as I thought action might be taken by the Council in the matter. I threatened to carry out your suggestion in telegram, and as the Council feared expense they met the matter manfully and I think we will now have a Board of Health all right. I have to thank you for your telegram, as it was the lever that moved the corporate body to more energetic action.

Yours truly,
 A. M. GREIG,
 Mayor.

P. H. BRYCE, Esq.,

Secretary Provincial Board of Health.

LANARK, July 30, 1886.

DEAR SIR,—A case of scarlet fever occurred in a house in this village about five weeks ago. The patient was a girl about four years of age on a visit here and whose parents reside in Perth where scarlet fever prevails to a large extent. The Board of Health placarded this house and engaged a man to attend to any errands outside that might be required, and who charged the Council \$1.25 per diem for his services. Can the Board or Council collect this amount from the father of the patient, who resides in Perth, and who came to some members of the Board and said they should appoint a man to wait on the household and do their errands, or can we collect it from the owner of the house where the patient was staying? The Board met with such opposition from both the father of the patient and the head of the household, where the fever was, that they wish to make some of them repay the cost of the man who was employed, and would prefer to make the father of the patient pay if liable, as he acted and talked in a scandalous manner on account of the preventative measures the Board used to prevent the spread of the disease.

Yours truly,
 W. A. FIELD,
 Secretary.

MR. P. H. BRYCE, M.D.

MIDDLEVILLE, Sept. 23, 1886.

DEAR SIR,—Will you please let me know if the Local Board of Health has power to prevent a mail courier (under contract with the Dominion Government), who has a number of cases of scarlet fever in his family, from carrying mails, or can they compel him to find a substitute? An early reply will oblige,

Yours truly,
 ARCH. RANKIN,
 Secretary Board Health.

LANSDOWNE, ONT., March 3, 1886.

The Secretary Provincial Board of Health.

DEAR SIR,—There is no Board of Health in our township and I take the liberty of asking you to whom application has to be made to establish a health officer in our township. There is a great deal of scarlet fever in our midst, of a very malignant type, and nobody seems to have any authority to compel the Trustees to close the schools, and very little, if any precaution at funerals is taken—or isolation; nothing in fact to prevent the spread of the disease. I have tried to do all I can, but it needs some one having authority to carry out the necessary regulations, and our township should not mind the small expense connected with the establishment of a Board of Health. Our doctor, Dr. Hanna, says that he has no authority to close the schools, but he, as well as I, have urged the necessity of closing. Only to-day one child was buried, and whilst away at the cemetery another one in the same house died of the same disease—scarlet fever—and yet people are so careless, and go to the house as though there were nothing amiss.

I remain,

Respectfully yours,

P. S.—If you have any instructions written for the public in reference to scarlet fever, please send me some, as I will gladly see to their distribution.

Diphtheria and Typhoid Fever.—From time to time throughout the year, reports from different localities have been received stating that outbreaks of either one or other of these diseases had occurred. Regarding the prevalence of Typhoid, if one were to judge from reports, there would seem to be little doubt but that the Province had this year enjoyed unusual immunity from its ravages. Nevertheless, the absence of any systematic series of local reports, except Annual Reports, makes it somewhat difficult to judge the prevalence of these endemic diseases until a year after their occurrence, by means of the report of the Registrar-General. The annually increasing number of properly organized Local Boards, and the increasing number of Medical Health Officers and Sanitary Inspectors, are, however, making the possibility greater of obtaining better information, within a short period, of the actual condition of health in our municipalities at any time when there seems to be, in any great degree prevalent, any of the common zymotic diseases. The Annual Reports, called for by law, of the Local Boards, which are greatly increasing in number and comprehensiveness, are sources of information more or less exact, according to the activity of the health authorities, and especially of the Medical Health Officers. As will be seen by consulting reports contained in the Appendix, Typhoid, though occurring in the different cities, does not appear to have been of the usual character, either in amount or severity during the year, but its diminished prevalence has been more than counterbalanced by the presence everywhere of Diphtheria. What the conditions are which determine the prevalence of Typhoid and Diphtheria respectively, are not as yet so definitely determined as to enable us to completely point out the different evils which must be remedied to prevent either one of them; but it would seem that, judging from our numerous Annual Reports of Local Boards, similar causes are set down as producing definite effects in outbreaks of Typhoid, or of Diphtheria, or of both. In Brantford, for instance, a canal basin, dry from the breaking away of a dam with the spring floods, and which receives sewage from various public and private drains, is represented as being the cause of numerous cases of fever, many of a Typhoid character; and in another outbreak, cans containing milk supplied to these families, had been rinsed with water from a well situated eight or nine feet from a manure pile and cow stable. In Galt, the impurity of well water in the lower parts of the town is represented as being a factor in the prevalence of Diphtheria and Typhoid. The Medical Health Officer of Guelph reports that many wells are too near the privies, that many of them are in addition polluted by surface water running into them, points out the danger of contamination from these sources and urges attention to the disposal of house refuse in ways other than throwing it on the ground. In Lindsay, Diphtheria prevails and the Medical Health Officer, in pointing out and urging the necessity for isolation and disinfection in such cases, states that “in no single instance did the disease appear *de novo* in dwellings properly drained and in which dry earth closets were used; and in no dwelling sanitarily perfect, where ordinary precautions were observed, did the disease extend to a second member of the family.” One case is cited in which there was an exception to this: In this instance, after the re-appearance of the disease, examination revealed an untrapped drain connecting with the public sewer

and opening into the cellar. This remedied, no new cases occurred. The Medical Health Officer of London says:—"Diphtheria and Typhoid prevailed to some extent in the 5th ward, where drainage is defective and well water in consequence notoriously bad." Further referring to an open drain in London East, which receives sewage from drains and privies, he says:—"This drain or ditch is the cause of a great deal of the sickness in that neighbourhood."

Thus reports everywhere state, with painful iteration, the continued reign of filth, or to put it in terms already used, "the microbes concerned in the decomposition of dead organic matter appear, under certain favouring conditions of the physical system, of climatic and meteorological conditions, to be capable of producing diseases of a septicæmic character from what is commonly called malaria, through varying grades of morbid conditions to the most malignant forms of Diphtheria and Typhoid fever." It will not fail, however, to be remarked by a perusal of appended Annual Reports, to how great an extent our municipal authorities and the people generally are waking up to the necessity for both municipal and personal cleanliness as regards premises, and with the prominence given by the Medical Health Officers to the necessities of public water supplies and systems of sewerage, we may well feel pleased at the progress being made everywhere by public health work.

In the matter of outbreaks of these diseases, however, it will be noticed that reference is frequently made in the Reports to the imperfect notifications of zymotic diseases, to the partial isolation and disinfection carried out, and the dangers resulting from the attendance of children from infected houses in the public schools. While recognizing the many difficulties in isolating the heads of families from the general public, there cannot be any difference of opinion as to the duties of the school and health authorities in the matter of children attending school. Diphtheria, prevalent at the present time in the country, is being propagated constantly by this means, and only in a few instances are effective measures being taken for limiting it. Dr. Squire's remarks regarding isolation in Scarlet Fever and Diphtheria are especially to the point in this connection:—

"I maintain that in Scarlet Fever isolation is the only means of guarding against infection; we cannot provide for ourselves or others the immunity against this disease that vaccination affords against Smallpox.

How are we to provide by inoculation in a disease that is clearly self-protective? The only answer here, as in diphtheria, is by preventing the inter-communication of the sick with the healthy. Neglect of this leads, especially in schools, to the increase of diphtheria."

But intimately connected with this is the question of notification of infectious diseases. We have this demanded by law of practitioners, but it is not generally obeyed, and as pointed out by Dr. Edward Seaton, Medical Health Officer for Chelsea, London, Eng., one reason for it is that there is not in our cities, or indeed anywhere, an efficient sanitary service for dealing with such cases. He says:—"Unless there is in existence a proper sanitary service, but little good can be derived from notification, and statutory powers for its enforcement cannot reasonably be required."

These remarks, it will readily be seen, apply with even greater force in many municipalities in Canada where health organizations limit themselves still in large measure to the ordinary work of abatement of minor nuisances and street cleansing. With so many reports indicating the prevalence of Diphtheria, it would seem hardly possible to select from them illustrations of what are considered as the causes in the many instances where such cases have occurred. Suffice to say that there is everywhere abundant evidence that where the disease originates locally there are always readily found on the premises abundant existing causes to account for the outbreak. More extended reference to these causes will, however, be found in the study found in a later part of this report on the special subject of Diphtheria.

II.—WASTE ORGANIC MATTERS, AND HOW TO DEAL WITH THEM.

I. *Public Nuisances and Unsanitary Conditions arising from House-refuse, Sewage, Cattle-byres, Slaughter-houses, Diseased Meat, Cheese Factories and Creameries, Manu-
factories, etc.*—In various Annual Reports I have dealt with the nuisances arising from

these various causes in separate sub-paragraphs, and have indicated some of the difficulties which have arisen in the experience of Local Boards which have attempted to deal with them. I have likewise pointed out some of the results of personal attempts to suggest remedies in those instances in which it has become my duty to deal with these matters. While it is true that each nuisance has some elements peculiarly its own, it has appeared to me that we are likely to arrive more quickly at a solution of the difficult problems presented to us in dealing with these matters by at once viewing them as simply one question of *how to prevent* the evils arising from the decomposition of organic materials and refuse, the existence of which is a fact and necessity everywhere that life is. Allow me to recall to your notice a few of the matters which, within the past year and similarly previous years, have been brought to our notice, and to refer incidentally to others of importance in districts and cities with industries differing to these with which we have mostly to deal.

Beginning with those rural municipalities in which the major portion of our population is, we have reported, at both ends of the Province, extensive outbreaks of Diphtheria. I am in a position to state that, regarding the local conditions in Essex, the use of water from shallow basins, scooped out of a black, decaying vegetable mould on the top of a hardpan sub-soil, is a common custom, while, to make matters worse, these limited supplies are not always kept free from contamination incidental to the presence of farm animals. The contamination of drinking water by animal excrement is, however, a matter unfortunately too common in parts of the Province with less excuse than some of the low lands of the south-west. The farm-yard well often yields a supply of water for household purposes and for drink to the farm hands. The following, from a letter by Dr. Mann, of Renfrew, is to the point :—

PETER H. BRYCE, ESQ., M.D.

RENFREW, 7th October, 1886.

DEAR SIR,—I am at present attending a family who reside in the country, in the Township of Bromley, in which there are two cases of Diphtheria and one of Typhoid Fever. During the time the member of the family now affected with Typhoid Fever was taken ill another member of the same family was affected with the same disease. I am anxious to ascertain for a certainty, if possible, the causes of the diseases above mentioned. In this family, to all appearances, cleanliness has been observed, and the surroundings are seemingly in good condition; but I find that for some time past the well from which the family have usually been supplied with water has been out of repair, and the water used for some time past has been taken from a well situated in a stable. The stable is very securely floored, and as far as the naked eye can see, none of the excretions from the horses have penetrated the flooring, which is composed of planks. The earth surrounding the surface of the well has not a disagreeable odor, but, on the contrary, is quite the opposite. I think that absorption must have taken place (of the excretions). But in order to ascertain of the matter, I send you two specimens of water to have tested. The bottle labelled "house," contains water taken from the well situated in the rear of the dwelling, and the other bottle contains water taken from the well situated in the stable.

Yours truly,

J. MANN, M.D.

NOTE.—Qualitative examination of these waters showed both to be contaminated with chlorides, while that from the stable gave evidence of great organic pollution.—P. H. B.

But the farm-yard well water is not limited in its influence to the farmer and his family. The following instances are illustrative. Dr. Griffin, Medical Health Officer, Brantford, in relating the outbreak of a number of cases of fever in different families, says :—"It was found that in the second and third houses attacked, in which were seven of the ten cases, milk was obtained from the same salesman, and this milk was found to have an unpleasant taste. On visiting the dairy, it was found that the well from which water was got for rinsing the utensils, was only eight or nine feet from the cow stable and from a large heap of manure, in such a position that it was impossible that the well should not be contaminated."

James B. Russell, Medical Health Officer, in a report on an outbreak of fever in Glasgow from milk, refers to the condition of dairy farms. In one place he quotes a description of a well :—"The well, on which is a pump, is situated immediately behind the byre and is supplied from surface drain from neighbouring fields. It is dry in summer and then water has to be carted from a quarry hole about a quarter of a mile distant. Milk is only sold in winter, cheese-making being carried on during the rest of the year." Dr. Stevenson Macadam, after analysis, characterizes the wells of the same villages as

"much polluted and decidedly unwholesome, and should not be employed for drinking or the making of food," while Dr. Russell further says:—"The population of Fergushill is 587; of Bensley, 318. There have been, during the last two years, over 100 cases of enteric fever in these villages. It is the usual fate of every new-comer to have this 'fever of the place.'"

Remembering that many hundreds of farmers are now engaged in sending milk supplies to the cities and growing towns of the Province, it need not be shown that the dangers on the farm do not end there, but, as in Glasgow, are carried to our large centres. That more disease has not been traced to this source in Ontario is, perhaps, more through want of investigation of the cause of outbreaks of disease than of its absence.

But it is not our milk supplies, as coming directly to the cities, that alone are important sanitary factors. In Ontario there are some 800 cheese factories, which together have a product amounting to:—

Yrs.	No. of factories in operation.	Quantity. (lbs.)	Value.
1882.....	471	39,346,095	\$4,259,141
1883.....	635	53,513,032	5,589,339
1884.....	751	66,939,573	6,998,889
1885.....	752	71,209,719	5,774,454

Remembering that not more than some six per cent. of milk is utilized in making the cheese, it is not difficult to comprehend that the disposal of the refuse whey, etc., from milk sufficient to produce, say 75,000,000 lbs. of cheese, becomes a question of serious difficulty. Remembering, too, that our rural municipalities number about 350, it will be seen that each has on an average two cheese factories; but so far evidence, gathered from partial reports, goes to show that the persons or companies operating them conduct them practically in whatever manner they please. Fortunately the commercial element is powerful in causing most to wish to make good cheese, and comparatively enormous strides have been made, as seen in the following extract:—

Ten years ago the Dominion imported cheese; last year the single province of Ontario manufactured 70,000,000 lbs., and exported to England alone cheese worth £1,400,000. Two or three years ago, Canadian butter was made at each farmstead, with every possible grade of care and negligence, science and ignorance, with the net result that a small portion was excellent, a certain quantity middling, and the bulk grading downwards to "very inferior." Two or three years ago co-operative dairying was started under the auspices of the Government and under the supervision of the Ontario Agricultural College. The idea of this system is that the farmers of a district possessing 500 to 1,000 cows among them, send their milk to a creamery. There it is treated in a most scientific manner by skilled hands, using the best machinery, the result being that butter is produced of a uniformly high quality, the farmer receives a better price, and the public a better article.

Nevertheless, as regards the results of the putrefaction of animal matters, lack of knowledge prevents, in large measure, an appreciation of its injurious results upon the quality of cheese and butter, and therefore of the adoption of measures for the removal of the nuisances arising from whey and from the presence of large numbers of hogs in the vicinity of the factories and creameries. Milk, more readily than any other food, is affected injuriously, and evidence of the most positive character is not wanting to show that bad water, unwholesome food, etc., cause sensible alterations in the qualities of milk.

Quoting from a report on Silos and Ensilage by the Agricultural Department of Privy Council Office, Great Britain, I find the following:—

"Disagreeable smell and taste are occasionally referred to as having been present in both milk and butter, which often disappeared upon reduction of the quantity of ensilage given. With reference to this objection, it is recommended that in feeding dairy cows with ensilage, much of it should not be near them during milking hours, and that persons so employed with it should wash their hands before milking."

So important, indeed, is this question of the characteristics of tainted milk, that it is most desirable that where so little has been known, every positive observation should be noted. I, therefore, would quote the following from a report on Milk Scarlatina, by

the Local Government Board, Great Britain. Dr. Cameron, who made the investigation, says:—

The Milk.—"In a specific disease affecting the constitution of the cow shortly after calving, it might be expected that the milk, being an animal secretion, would be in some way affected by the disease. Specific virus circulating in the cow's blood is obviously likely to contaminate the milk produced by her, and through this medium to convey the disease to human beings. Early in the disease the milk of cows suffering in this way, was described, 'ropy,' 'slimy,' or 'as thick as a pudding.' This condition of the milk may occur, it is said, even before the vesicles appear upon the teats and udder, or the eruption on the hind-quarters. It shows itself in milk that may have been set aside for from six to twelve hours for the cream to rise, and it ought to be looked for in all suspicious cases of cow illness. In some cases when the cow is being milked, the first few 'draughts' of the teat may bring thick or knotty milk, but afterwards there is nothing abnormal to be seen in it. In many cases there is nothing particular discernable about the milk as it comes from the cow; it flows freely, and looks exactly like ordinary milk. As the milk from this dairy farm was sent direct from the farm to the milk shop, and immediately distributed to the customers, this peculiarity would not have had time to show itself; and, further, as the cream is now usually removed by 'separators,' this milk would not, in all probability, have been set aside for the cream to rise. In cases where, at a dairy farm, only one or two cows are suffering from a mild attack of the disease, this ropiness might not show itself if the milk was mixed with a quantity of milk from healthy cows, although this mixed milk might very well be capable of injuriously affecting those who consumed it.

"I believe that this ropiness of milk appears in several cow diseases. Its precise nature and the causes which give rise to it require careful investigation. It was particularly noticed and described to me by several persons as having been observed by them, about three years ago, in milk supplied from another dairy farm in the district, a few days before a severe outbreak of diphtheria among consumers of the milk. This ropiness of the implicated milk was the subject of much discussion at the time, and was attributed by the farmer to feeding the cows on too much clover hay. He admitted the fact of the ropiness of the milk, and took, he said, milk from each individual cow to see, if possible, which animal gave ropy milk, but he did not set the milk aside to stand awhile, and so failed to detect the culprit. Unfortunately, in this instance, several of the cows were removed and killed before there was a chance of examining them, and so an opportunity of gaining, perhaps, important information was lost. This outbreak was the subject of special inquiry and report by Mr. Power." [See Medical Officer's Report to the Local Government Board for 1883, p. 42.]

In a country so largely agricultural as is this Province, it is but natural that we should find that in matters other than milk supplies we have conditions in rural municipalities demanding intelligent observation and watchful care. Within the past two years in south-western Ontario, swine-plague has appeared and has resulted in much financial loss to the owners of hogs. Introduced accidentally into the townships bordering on Lake St. Clair, in Essex, it has shown itself a zymotic of definite characteristics, and has given excellent opportunities for the study of the propagation of epidemic diseases. I am informed by Dr. Cowan, V.S., acting Dominion Government Inspector, that, in many instances, the cases where swine-plague prevailed with greatest virulence were where organic accumulations, as of fish-refuse, along the river or lake shore abounded, or on those farms where general neglect was most apparent.

Quoting from a report on Swine Fever in Great Britain, by Prof. Brown, Agricultural Department, Privy Council Office, I find it stated as follows:—

"Imperfect cleansing and disinfection of premises may be reckoned among the causes which have contributed to the continuance of swine fever, notwithstanding the operations of regulations which might have been expected to produce good results. Very frequently swine are kept in places which cannot be cleansed and disinfected effectually, so as to make them safe for the next lot of pigs which will be brought in as soon as the place is declared free. Old, half-rotten styes with mouldy floors cannot be cleared of infection by any known process. The only course in such cases is to remove the infection-saturated timber and soil and submit them to the action of fire."

Apart from the points so thoroughly illustrated here of the supreme influence which organic filth has in perpetuating and intensifying zymotic diseases, the presence of "swine-plague" or "hog-cholera" in the Province has a peculiar interest from its intimate relationship to Typhoid Fever. Dr. Budd designated this disease "Typhoid Fever in pigs," and remarked "that the disease is attended and characterized by a peculiar ulceration of the intestinal follicles. So with the disease in the pig, it too is a Typhoid Fever, characterized and attended by a series of ulcerations of the intestines which are, in some respects, the very counterpart of the ulcerations found in the human intestine, so that the two may be regarded as exact pathological equivalents."

A peculiar but most important pathological condition has been remarked by Prof. Brown and others, inasmuch as it would seem to show something of identity in the effects of different enzymes or blood-ferments. He says:—"In some cases the whole of the mucous membrane of the intestine was covered with a croupous or diphtheritic deposit of a dirty, white colour, and it was only after the deposit had been cleared away that patches of inflamed and perhaps ulcerated structure could be seen."

Still following up the evidence of the intimate relations of the decay of organic matter, with the development of other forms of disease, I would refer to the occurrence of glanders, primarily, in connection with unsanitary conditions of this nature. Veterinarians elsewhere, but also in Ontario, refer to the occasional occurrence of the disease of glanders, particularly in horses, and from time to time give such illustrations of its etiology and progress, as the following, taken from the Sixth Annual Report of the State Board of Illinois :—

"The infected farm of the late Wellington Conaway, distant about a mile and a-half from Coleta, was visited the same afternoon. While all the dwellings and outhouses on the farms for miles around bear evidence of prosperity and good taste, the dwellings and outhouses on the Conaway farm were remarkable for a very conspicuous contrast to all the others. . . . The floor of the dwelling is raised about two feet from the surrounding surface, and there is a cellar underneath, full of putrid and decaying animal and vegetable matter, skeletons of hogs, dogs, etc., evidently the accumulation for years. A strong, penetrating, indescribable odour pervaded the dingy, filthy rooms in the house, in spite of a very recent sham performance of disinfection with chloride of lime, which was said to have been sprinkled here and there, but perhaps only in the room that was occupied by the deceased father and son during their brief illness. . . . In the stalls were five horses of various ages, and in moderate condition as to flesh; otherwise they were dirty and rough-looking. One by one they were led out for inspection, and were found to be suffering with glanders in various stages of development."

As indicated by the context, there were two deaths in the family referred to, caused by glanders. The peculiar nature of the disease in its extreme contagiousness, owing to the location of the disease about the air passages, as well as in pustules on neighboring parts, as also the very high fatality in cases which do occur in man, marks it as one which deserves more attention than in Ontario has been paid to it as yet by sanitarians.

In the matter of another animal disease (pleuro-pneumonia), which has occurred in Canada during the present year, and which, from the long incubation and slow progress through its various stages, we cannot fail to see most important sanitary relations, I shall refer to an article in the United States Report of the Bureau of Animal Industries, by Dr. Ezra M. Hunt, of New Jersey; the situation of this State at the eastern terminus of a large portion of the east-bound cattle trade, giving him peculiar facilities for obtaining practical experience in these diseases. He says :—

"Some of the roundabout tracings of an outbreak are as curious as they are annoying. Thus, in December, 1881, we lighted upon a herd in an out of the way locality, in Warren County, from which no other herd became affected. . . . It had been brought directly by the purchase of three or four Alderney cattle in New York city by the owner of the herd, who lived elsewhere."

"In the same year a Children's Home on Staten Island suddenly came to have a deficient supply of milk, and was compelled, without knowing the cause, to change its source of supply. The herd was affected with pleuro-pneumonia. A Staten Island dealer in poor meat bought this herd at a very reduced price. Some of the sickest cattle were killed, while three others were privately boated over one night into New Jersey and sold as milch cows."

The occurrence of several epidemics of trichiniasis in European countries at different times from eating the meat of hogs, very naturally calls for some remarks in this connection. Very grave complaints were made in 1884, both in France and in Germany, respecting dangers arising from eating American pork. In consequence of the threatened prohibition of its entrance to these countries, the whole matter came to be looked into with an unusual degree of thoroughness. The results have been to show that all pork is liable to be more or less trichinized. In 1,000 hogs examined in Montreal in 1883 by Prof. Osler, four per cent. were found infected, and Dr. F. S. Billings, Boston, reported the same per centage in 8,773 hogs examined. With such facts, and the possibility of severe and often fatal disease connected with their presence in pork, it will readily be seen that should it ever be found that pork, cooked in the customary fashion might cause the disease, there could be but one of two alternatives—either cease using pork as food, or having it cooked in some other fashion. It is, however, very comforting to find that when meat is well cooked, as it is by most English speaking communities, danger from this cause is slight. The danger varies to some extent with the method.

"Rupprecht observed that rapidly fried sausage only had an interior temperature of 53.5°C. and was still capable of producing infection. Cohen had a steak weighing half a pound heated for ten minutes when its appearance on cutting was white, without any red points. It still contained living trichinæ, however, which, being fed to a herd, were afterwards found developed in the intestine."

"Fiedler's experiments show that trichinæ are quickly killed at 62.5°C. (144.5°F), Fjord's investigations show that the interior of a ham weighing eight pounds reaches 65° C. after boiling two hours and seventeen minutes."

Brouardel and others have shown, however, that salting or curing of hams as commonly practiced, is in all cases where the curing has gone on for a number of weeks and months sufficient to destroy trichinæ. Brouardel found, however, in investigating (1883) outbreaks in Ermsleben, that there is a gradually lessening vitality of the trichinæ with every day the pork has been salted; thus: an "animal was killed on the 12th of September, and of those who partook of this meat on the 13th, 33 per cent. died, while of those who did not eat of it till the 18th and 19th, none died."

All evidence pointed to the fact that this decreasing vitality of the trichinæ, as judged by results, was due to the slight salting. With such a proportion of trichinosed hogs, probably always present in the country, it becomes quite evident that, not only may their meat be eaten raw, but fresh sausages, a common form of preparing it, are by no means free from danger. Bacon may fairly be considered as being in quite a different category, as far as regards danger from eating it is concerned.

There is still one more important factor in this relation of the health of animals to the public health remaining to be noticed, viz., that of tuberculosis. The results of investigations during recent years into the cause of this disease, and especially since the discoveries of Koch, have been such as to draw the special attention of both medical men and veterinarians to the aspect of the disease in cattle as affecting the public health. The disease according to different observers, has been increasing year by year, especially in house or store cattle, increasing by those cattle kept in byres in towns and cities for milk purposes, and those of the pure breeds, in large measure stabled, and kept for breeding purposes or fed for the meat market.

The following are given as illustrative evidences of the prevalence of the disease:—

Prof. Law states "that 29 per cent. of the adult males (cattle) dying in New York city, are tuberculous, and that in certain of the herds that supply that city with milk, 20, 30, and even 50 per cent., are affected with the same disease. In some country districts of New York can be shown large herds with 90 per cent. the subjects of tuberculosis. Were all the known facts published concerning the ratio of tuberculosis in certain communities, and in the herds supplying their meat and milk, there would be testimony far more telling than ever the striking example of New York city. One stands appalled at the immensity of this evil, covering as it does the entire country, threatening at every step the health of the community, and crying loudly for redress."

In view, therefore, of the prevalence of this disease in animals, I propose to give some of the principal conclusions which have been arrived at by some of the most eminent authorities in relation to the contagious qualities of the disease, and its relation to consumption in man.

In September, 1883, there assembled in the Fourth International Veterinary Congress, at Brussels, 311 veterinarians, and during the discussion on pulmonary phthisis, the following amongst many of the propositions were discussed. Prof. Lydtin, of Carlsruhe, presented the report of the commission appointed to consider this subject, and proposed amongst others the following resolutions for adoption:—

1. "Tuberculosis is transmissible hereditarily.
2. It is contagious.
3. It should be included among infections, which should be opposed by measures of sanitary police.

(a). Every owner of domestic animals must report promptly to the authority charged with this police service every case of tuberculosis, and any symptom causing suspicion of the existence of this affection; he must keep every animal attacked or suspected out of any place where it may be liable to transmit the malady.

(c). The suspected as well as the diseased animals should be sequestered, and their slaughter ordered by the police; animals suspected of being infected should be kept in quarantine, unless there are comparatively few, in which case they should be slaughtered by official order. If a large number are suspected, they may be fattened and sent to the abattoir as quickly as possible.

(d). Infected stables and other places should be under the special surveillance of the police for an entire year, counting from the last case of the disease. The sale of beasts suspected of infection should be interdicted, unless it is for slaughter, and under the inspection of a veterinarian.

(e). The place occupied by a tuberculous animal ought to be cleansed and disinfected, the animal having been previously removed; it ought to be the same when the malady has disappeared from stables and other closed places in which tuberculous animals have been kept; it is only after disinfection that the prescribed police measures should be removed. During the whole course of the panzootic the stables should be especially well ventilated.

(f). The flesh and viscera of a tuberculous animal can only be utilized for consumption when the disease is found in the cadaver in its incipient stage, when the lesions are confined to a very small portion of the body, when the lymphatic glands are still free from all morbid tuberculous lesion, when the tuberculous formations have not yet undergone softening, when the flesh presents the characters of meat of the first quality, and when the animal is in a good state of nutrition at the time of slaughter.

It should not be permitted to remove the flesh of tuberculous animals, admitted to have consumption, out of the locality where they have been slaughtered, and it should not be offered for sale in the ordinary butcher stall.

Every quarter of meat and viscera showing lesions of tuberculosis, as well as the flesh of any other animal in which there is found at the necropsy a tuberculous infection more pronounced than that referred to above, should be watered with petroleum oil, and afterwards buried under police supervision. The extraction of fat by cooking and the utilization of the skin may be permitted.

(g). The milk of animals suffering from tuberculosis, or suspected of it, should not be consumed by man nor certain animals. The sale of such milk should be severely interdicted. The milk of animals suspected of infection should only be used after boiling.

(j). As a safeguard of the public health against the dangers which threaten it through the consumption of flesh furnished from diseased animals, of stale or putrid meat, and of falsified sausage and mince-meat, there should be established in every commune a competent service for the inspection of meats.

(k). Establishments which make a specialty of furnishing milk for invalids, or for infants, ought, as regards these milch animals, to be submitted to a constant control confided to veterinarians officially designated for this purpose."

Prof. Law, of Cornell University, remarks concerning cheese:—

"In recommending these resolutions for the adoption of the Congress, it has been felt that they are fully called for, in view of the danger which has long threatened the interests of stock owners and the health of the community, and which constitutes a veritable calamity."

He further says:—

"Again it agrees with other infectious diseases in being favoured by certain unhygienic conditions, as damp pastures, close, filthy buildings, over-crowding, poor food, excessive work or milking, etc., yet is not absolutely dependent on any one or more of these, nor due to these alone. . . . To the same effect speaks the great prevalence of tuberculosis in dairies near cities, where the stock is often changed, and new stock is being constantly purchased, and its almost complete absence from districts exclusively devoted to breeding, and never importing strange stock. This is but a repetition of what is known of other contagious diseases. Wild races, too, living in the open air, are largely exempt."

Prof. Law quotes from the report the opinion upheld by numerous high authorities, that:—

"The morbid principle can enter the system either by the respiratory or digestive apparatus. The inspired air, and the forages and drinks can act as vehicles; it may also be transplanted by way of the generative organs, or by wounds, accidental or experimental."

Prof. Johnes concludes:—

"That Tuberculosis can be transmitted from animal to animal, and from man to animal by feeding on tuberculous substances; but this mode of transmission is much less certain than by inoculation.

2. "The materials which most certainly transmit tuberculosis by gastro-intestinal injection are tuberculous matter taken from the lungs, pleuræ and lymphatic glands: milk of tuberculous animals, as regards its contagious properties, must be placed near to these. Infection by tuberculous matter taken from man is less certain than by that taken from animals."

"Toussaint found the tubercular lung products of cows constantly infecting to rabbits and pigs, after they had been subjected to 55°-58° C. in a water bath, and even after they had been roasted like a beef-steak in the gas flame. He found the nasal discharges, the saliva and the urine infecting and, as already noticed, the lymph of a vaccine vesicle."

Lydtin concludes:—

"That tuberculosis is contagious, like glanders or lung-plague, and that contagion fills a more important role than heredity in the propagation of the disease."

Stang reports a "Case of the accidental infection of the son of healthy parents by the habitual drinking of the warm milk of a tuberculous cow."

Prof. Law says:—

"It is only necessary to add that tuberculosis in animals tends to concentration in the large dairies and feeding establishments which supply the great centres of population. The farmer, watching closely the animals he has owned since their birth, is led by the instinct of self-protection to sell off those that show symptoms of failing, and those usually go to the large establishments near the cities, there to be crowded in close buildings with many others, to which they in turn convey the infection. If in a dairy, these supply milk for the population at large, including the susceptible infants and invalids, and finally all or nearly all of such animals find their way to the butcher's stall, when they can no longer be utilized for other purposes."

As regards the use of tuberculous meat for food, Bouley insisted that the meat of tuberculous animals should be excluded from the food of man, whatever may be the stage of the tuberculosis or the apparent qualities of the meat. Van Hertsen, of Brussels, stated his practice at the abattoirs there to be to seize all except those carcasses where the tubercles are localized and recent, and provided the carcase is sufficiently fat to guarantee good meat.

Having pointed out fully this disease in its relationships, as regards animals, we must return for a moment to its connection with the ordinary decomposition of organic matter. Mr. John Simon, C.B., wrote in 1867: "That vastly fatal disease (phthisis), if we are to have any proper knowledge of its causes, must be studied from many different points of view." His investigations shew it to be a disease "which undergoes development in proportion as men are gathered together in indoor industries." And again he says, "it is shown to be a disease which develops itself in proportion as men are dwelling upon a humid soil." Referring further to organic impurities, I would quote what I have written elsewhere regarding crowded apartments:—

"The insufficiency of oxygen, the excess of carbonic acid, and the volatile emanations of those inhabiting the place, and the frequently vitiating action on the lungs of air containing much dust and insufficient moisture, all tend to induce anæmia, catarrh and other derangements, which not only lessen the resisting power of the system to disease, but, also, by colds and catarrh, causing congestion of the mucous tract, produce just such conditions as form a *nidus* favourable for the reception and subsequent growth of bacillus tuberculosis."

Regarded, therefore, as a zymotic disease, it is apparent that in relation to it we have the same difficulties to deal with respecting its prevention as we have with regard to any other disease. As Miquel has pointed out, *humus*, or the mould of the upper soil, is rich by virtue of the incalculable number of micro-organisms constantly feeding upon it; and from such decompositions, when not turned to good uses by the growth of vegetation, is developed what is the universal attendant of damp soils—malaria.

Victor Horsley, B.S., M.B. (University Coll., London), thus speaks in this connection:

"The forms most commonly found are micrococci and bacilli, and, as might be expected, the superficial layers contain the greatest number; while, further, the bacilli are found, especially when the soil is saturated with decomposing animal and vegetable fluids (manures, etc.), the organisms decrease in frequency with the depth investigated, until at about one metre the undisturbed earth is apparently free from them. In connection with the existence of organisms in the earth, it must be remembered that (1) probably the lowest winter temperature has not the slightest influence on their actual vitality, and that (2) the penetration of the soil by them will differ according to the possibility of carriage by the soakage of water. While some of the zymotic diseases are possibly mycotic in origin, and are undoubtedly connected with obscure changes in the soil, which may be termed healthy, evidently requires thorough investigation, and would afford a firm foundation for the subsequent research into the etiology of cholera and malaria."

The preceding paragraphs have been devoted to the illustration of two apparently universal laws:—

1st. That decomposition, dependent upon the presence of organic accumulations, seems invariably favourable to the development of zymotic diseases both in men and animals.

2nd. That these diseases are prevalent and severe in proportion to the amount of such accumulations, associated with the concurrent fact that where these unsanitary conditions most abound isolation of disease where existent is invariably most imperfectly carried out.

From these two conclusions it readily appears that from the sanitary standpoint, we have two plain and distinct tasks before us, the first being, how best to prevent the accumulations and decompositions of organic, especially animal matters, and second, how to prevent the serious effects incidental to the presence of disease in animals, on which we are dependent for our milk and food supplies. In the several reports (*vide* report on Cheese Factories, and the report on the Toronto Cattle Market), found in the Appendices, we have both of these matters to some extent dealt with. The details of the measures necessary to be adopted, are varied both in character and the facility with which they can be carried out. They may, however, be said to be included, as far as their execution goes, under two heads—(1) individual, (2) municipal.

Discussing individual measures it will be seen that the prime necessity is to have people everywhere appreciate the first well-proved fact, that the presence of filth means putrefaction, and putrefaction sooner or later means disease. With this must be taught the associated fact that the proper disposition of so-called organic filth, has a direct economic value. Thus if the farm-yard be cleansed of its manure twice yearly, and if added to this the farm-yard surface be graded and paved, so that its fluids are drained to a cistern, several economic results are obtained, (a) the manure value maintained to an extent of fifty per cent. or more beyond the ordinary; (b) the pollution of the soil sur-

rounding the well from which stock are supplied will be in a large measure prevented. The importance of the result cannot be over estimated and up to the present is scarcely comprehended at all, much less fully appreciated by the ordinary farmer. In a number of the instances already quoted, going to show that immunity from disease, under unsanitary conditions cannot long exist, we cannot fail to appreciate the fact that bad water and bad air must affect the health of animals, to the extent not only of creating disease in them, but of producing illness in persons using milk and flesh. Prof. Robertson, Director of the Creamery at the Agricultural College, has stated to me that the appearance of certain milk, occasionally received from the farmers, was such as to lead to a very strong suspicion of its being unwholesome, and of having come from a diseased cow. Unfortunately the power of contamination residing in the milk of one such animal is almost unlimited, and cannot fail to be productive of such intense poisons as the *ptomaine tyrotoxicon* found to be developed in cheese. *Vide* report by Prof. Vaughan, Ann Arbor, Mich.

That such milk may likewise be a carrier of disease, has been already illustrated in the case of scarlatina, and many similar examples have been given in the case of diphtheria. The dangers are still more evident if we hold to the belief of Naëgeli, that any of the forms of bacterial organisms may under certain conditions become pathogenic, or may manifest itself "as the agent of acidification of milk, of putrefaction, and as the agent producing several maladies."

The duty and advantages of not having a farm-yard well contaminated are thus made most evident. But the evils may result in other ways; observing dairymen have found in occasional instances that the milk of cows drinking water contaminated with decomposing whey allowed to run into a creek, has injuriously affected that supplied to cheese factories; while I have heard the same thing stated regarding the organic refuse from a woollen mill poured into a creek. Refuse whey may, however, be injurious in two other ways, one by its being allowed to contaminate the water supply used in a creamery or dairy, and the other by its putrefaction in vats, etc., near the building, creating effluvia which, borne on the atmosphere, contaminate the air of the creamery itself.

Allied evils do not infrequently grow out of the reprehensible habit of feeding large numbers of pigs within no long distance from cheese and butter factories. Water from impure sources, whether farm-yard or house-well, as also from polluted streams, used in rinsing the cans, may similarly produce evil results. Effects, of an allied nature in their results, are associated with the drinking water of houses, when contaminated either by surface soil-soakage in the back-yards, and by that from privies, or that of public water, when the sewage of one town is allowed either to pollute its own water supply or that of a neighboring town, as shown in the cases *re* cholera cited, in the introduction to this report.

Organic accumulations in cellars, and associated fungoid growths from the decay of wooden foundations, also the collections of garbage in dust-bins, back-yards, dumping grounds, etc., while altering the method of reception by the system, are similarly examples of putrefaction, which along with that of vegetable decomposition in damp soils, must be limited or prevented, if diphtheria, typhoid, malaria, and other forms of septicæmia are not to continue to prevail. Dr. Meredith Clymer has shown from actual statistics regarding the epidemic of cerebro-spinal fever, as it existed in New York 1872, "that when the disease occurred away from the marshy districts, the elected haunts were densely populated tenement dwellings, in which the house drainage was invariably in bad condition. . . . Wherever we have examined the local conditions, it has been found that the drainage of the premises has been faulty, or that the immediate surroundings have presented such conditions as must necessarily give rise to some form of disease—cellars containing decomposed or decomposing vegetables, garbage, or other filth, in a putrefactive condition, and privy vaults located beneath sleeping-rooms, windows in *cul-de-sacs*, where there were no free currents of air. The most usual defects discovered were connected with house drainage."

Refuse "destructors" are thus seen to be not only a remedy, but a necessity in order to remove the dangers from this form of organic filth. Several cheap and satisfactory forms are now constructed, and our municipal authorities may fairly take up the matter.

We have thus naturally come to the municipal work necessary in this connection. Rural Boards have a special work in causing creameries and dairies to be licensed and carried on under strict supervision, and ought further to maintain some oversight in the instance of dairy farms. But the chief work must lie with civic Boards. Their labours, from what has been already stated, must cover several fields, as the licensing of vendors and the inspection of milk supplies, not alone in the town, but at the farms where obtained. The town shops and houses of the vendors must also be closely scrutinized. The matter of meat inspection is not less important, as, in extended quotations, has already been pointed out. Abattoirs near cattle-markets, and an individual inspection of animals before and after slaughtering, as well as a strict oversight of butcher-stalls, and butchers' houses are a *sine-quanon* to safety in this direction. "Cremators," or garbage destructors, are necessary and component parts of any system of inspection, which is going to thoroughly carry out the idea of preventing organic accumulations.

Concluding this paragraph, I quote from Dr. Ballard's "General Report of the results of the Sanitary Survey made in anticipation of Cholera, 1885-1886, by the Local Government Board," the various matters inquired into; and would further say that these, in addition to several others already referred to by me, must be made the special work of local sanitation, if filth-diseases are to cease to dominate:

- (1) General cleanliness; (2) Drainage; (3) Excrement conservancy and disposal;
- (4) Removal of solid refuse, vegetable or animal refuse and domestic dust or ashes;
- (5) Water supply; (6) Condition of dwellings of the poor and labouring classes, overcrowding upon area and overcrowding in dwellings; (7) Sanitary administration;
- (8) Medical officers of health; (9) Work of the inspectors of nuisances; (10) Hospital provision.

III.—REVIEW OF PUBLIC HEALTH WORK IN ONTARIO FOR THE SEMI-DECADE 1882-1886.

Report on Sanitary Organizations in Ontario prior to formation of Provincial Board in 1882; on the work done under the Act of 1882 prior to the Act of 1884, making the organization of Local Boards compulsory; and on the progress under the Act of 1884 and amendments thereto, viz., the Acts 1885-1886.—Retrospects are not always, and need not invariably be, pleasant, but from the fact that memories of what is pleasant tend to linger, it gives me pleasure to recall to your remembrance, by a rapid review of the Board's work during the five years of its existence, some of the important tasks undertaken and labours performed, so that through this report the public generally may be able to gain a comprehensive idea of what is embraced under the Department of Public Health, and of what the Government has in its legislative capacity been endeavouring to perform in their behalf.

The municipal councils of cities, towns, villages and townships throughout the Province before the year 1882, had the power, under Chapter 190, Revised Statutes of Ontario, to appoint Health Officers to look after the health interests of their respective municipalities. This system, however, was not of such a nature as to cause any marked improvement in health matters; on the contrary, it had been shown that many municipalities neglected to look after the sanitary requirements of the people, and that scarcely any steps were taken to have householders become educated in a matter of such vital importance to their well-being and that of the community at large. The result of this was that the people did not know what precautionary remedies to adopt in order to ward off an epidemic of disease, nor, in the event of an epidemic arising suddenly in their midst, what course to pursue in order to check its progress. Many people then wondered why such diseases as Typhoid Fever, Diphtheria and Scarlet Fever, should break out, perhaps in a family whose house was a model of cleanliness, compared with many others in its vicinity. Further than this, when the disease did break out, few thought of or knew the necessity for isolating the patient, nor was there any proper knowledge of the necessity for or the use of disinfectants; communication between the infected family and the neighbours was the rule rather than the exception, and examination into the local sanitary conditions of infected dwellings, if made at all, was made without any distinct idea of what evils there were to be remedied.

As an illustration of how imperfectly municipal health work was understood or performed at that period, it may be mentioned that during the years 1872, 1873, 1874, Smallpox appeared in every county in Ontario, causing 371 deaths, while in 1883, 1884, 1885, it appeared in only fourteen counties, causing 84 deaths. Such, then, were the conditions prior to 1882, when, after considerable discussion, "An Act to establish a Provincial Board of Health and to give increased powers to Local Boards of Health" was passed by the Legislature. Its objects as set forth in clause 3 were :—

"The Provincial Board of Health shall take cognizance of the interests of health and life among the people of the Province. They shall especially study the vital statistics of the Province, and shall endeavour to make an intelligent and profitable use of the collected records of deaths and of sickness among the people; they shall make sanitary investigations and inquiries respecting causes of disease, and especially of epidemics; the causes of mortality and the effects of localities, employments, conditions, habits, and other circumstances, upon the health of the people; they shall make such suggestions as to the prevention and introduction of contagious and infectious diseases as they shall deem most effective and proper, and as will prevent and limit, as far as possible, the rise and spread of disease, and they shall, when required or when they deem it best, advise officers of the Government and Local Boards of Health in regard to the public health and as to the means to be adopted to secure the same, and as to location, drainage, water supply, disposal of excreta, heating and ventilation of any public institution or building."

Amongst the first Acts of the Provincial Board of Health, which held its first meeting in May, 1882, was the issue of a circular to the clerk of every municipality in the Province, asking them to inform the Board whether their respective Municipal Councils had complied with the powers conferred upon them by Cap. 174, Section 466 and subsequent sections of the Revised Statutes of Ontario, giving them power to enact by-laws for the preservation of the public health, the prevention of contagious diseases, etc.; and accompanying this was a letter to physicians, asking them to use their influence in urging municipal authorities to take action in matters relating to the public health. Further, a very large amount of sanitary information in pamphlet form was prepared by the Board and issued in all directions throughout the Province. Medical men were asked to report to the Board monthly the diseases occurring in their practice—to which request a liberal response was given. A map of the Province was made and divided into ten health districts, on which all the diseases as reported by the physicians were entered for the information of the public. When thus completed it was printed weekly under the title of the *Health Bulletin* and distributed to municipal councils, newspapers, physicians and sanitarians in Ontario, as well as to sanitary exchanges in the States of the Union. Many visits to various municipalities were made by the Secretary and other members of the Board during the year, for the purpose of investigating unsanitary conditions complained of and of impressing on the minds of local health authorities the necessity of carrying out the laws already laid down for their guidance, as well as the suggestions of the Provincial Board, in order that a correct system of health work might be inaugurated. In addition to Commissioners appointed to collect sanitary information in Great Britain and in several of the United States where State Boards of Health were in active operation, a Sanitary Convention was held in St. Thomas, under the auspices of the Board, at which papers on various important subjects were read. Investigations were made into the causes of outbreaks of Typhoid Fever at Sarnia, Stratford and Lambton Mills, of endemics of Malaria at Madoc and Coboconk, as also a report on the sewerage system and water supply of Toronto.² Pamphlets were also prepared by the Board on "How to Check the Spread of Contagious or Infectious Diseases," and on "Directions for the Resuscitation of the Apparently Drowned." Such was the principal work done by the Board in 1882. During the winter of 1882-1883 lectures on various sanitary subjects were delivered by members of the Board in a number of places, under the auspices of Mechanics' Institutes, School Boards, Literary Associations, etc.

In 1883 the work of the Board expanded in every direction, as will be found by consulting the report for this year. Some of the more important work done was the following :—

Compilation and Study of Weekly Reports of Diseases in Ontario.

Reports on outbreaks of Smallpox at Port Arthur and along the C. P. R., at Peterborough and Claremont; of Measles at Dundas and Hamilton; of Typhoid at Niagara Falls and the Belleville Institute; of Diphtheria at Dickinson's Landing, Easton's Corners, etc., and report on Malaria in the Grand River District, and on the London West floods.

Copy of circular to Clerks of Municipalities and Medical Correspondents of the Board and answers thereto; report of the Committee on Adulteration of Foods; report of the Committee on Epidemics *re* Summer Resorts for Children, and Model Dairies in Brussels; report on the Disposal of Sewage, Toronto Island; report of delegates to the American Public Health Association.

By-laws suggested for the guidance of Local Boards of Health; pamphlet entitled "Directions for Preventing the Spread of Asiatic Cholera;" pamphlet on the "Disposal of Sewage."

Reports regarding Doncaster, Leslieville and Richmond Hill fat-rendering establishments; on Toronto Cattle Byres; on the Smoke Nuisance.

Report of Special Committee regarding a Text Book on Hygiene for Schools; of a Committee on School Hygiene; on School Visitation and Medical Inspection of Schools, Asylums, etc., in France.

An important Sanitary Convention was also held in London during this year and lectures were delivered by members of the Board in various parts of the Province. From this record it is evident that the Board was equally enthusiastic, both in its work of propagandism and practical sanitation. After two years' experience, however, it was felt that better local organization was imperative if executive work was to be effectively carried out. Through all the efforts put forth, the Board had positive information regarding the existence of only fifty Local Boards in forty counties; of twelve counties with no Boards; of ten Boards with sanitary inspectors (one salaried); of four medical health officers; of three Boards with medical members, and one Board with three salaried members. Toward this end the Board therefore directed its energies, and for three months during the winter of 1883-1884, committees of the Board spent a very large amount of time and labour in preparing a comprehensive Health Act, based upon the primary condition of Local Boards of Health being compulsory, to be appointed by the Council in every Municipality in the Province.

The Public Health Act of 1884, which is the outcome of this work, makes it incumbent on all Municipal Councils to form Local Boards of Health each year immediately after the Councils themselves are elected, and to possess all the powers hitherto vested in the Councils regarding matters appertaining to the public health. Copies of the Act were mailed to the Clerks of all the Municipalities, (who were thereafter, in accordance with section 17 of said Act, to be the secretaries of the said Local Boards) together with a circular, asking them to call the attention of their respective Councils to the provisions of the Act and in conformity with it to have Local Boards appointed without delay, and notify the Secretary of this Board of such appointment being made, giving the names of the members who were elected chairmen, and their residence. While it is true that quite a large number of municipalities, especially in rural districts, did not act in the matter during the year, owing (as the enormous amount of correspondence with them, answering queries of how to proceed, explaining away various clauses of the Act, etc., etc., will show) to their not thoroughly understanding the meaning of some of the clauses, yet there is abundant evidence to demonstrate that a large amount of interest was taken in public health work, as shown by the following results. Of Local Boards of Health established in 1884 there were:—

In the 447 townships in the Province, there were 184 Local Boards formed, twenty-five of them having Medical Health Officers and nineteen of them Sanitary Inspectors, while seventeen had appointed both Medical Health Officers and Sanitary Inspectors. In the 203 cities, towns and villages in Ontario, there were 180 Local Boards established, and of this large proportional number 63 had Medical Health Officers, 92 had Sanitary Inspectors, and 44 had both Medical Health Officers and Sanitary Inspectors.

To add to this grand showing it must be borne in mind that it was all accomplished between the 1st July and 1st November, 1884, or in the small space of four months after the passage of the Act. Every care was taken in this year to continue the work of disseminating sanitary literature, in order that local health authorities might be put in possession of such information as would tend to promote the interests of their district and enable them to more clearly understand the work which they were appointed to perform.

In order to give a correct idea of the nature and magnitude of the work performed by the Board in relation to the investigation of unsanitary conditions and the outbreaks of disease in different parts of the Province, we cannot do better than give the following as a summarized list of what was done :—

Teeswater—Investigation of a nuisance caused by a jam in a stream ; *Point Edward*—Investigation into outbreak of Smallpox ; *Almonte*—Investigation by the Secretary into an outbreak of Typhoid Fever ; *Smith's Falls*—Investigation by the Secretary re an epidemic of Diphtheria ; *London West*—Investigation re a mill-dam nuisance ; *London East*—Carling's Creek nuisance ; *East Zorra Township*—Investigation into an outbreak of Smallpox ; *Woodstock*—Disposal of sewage difficulty ; *Haliburton, Peterboro', etc.*—Investigation into saw-dust nuisances ; *Flos Township*—A case of Smallpox ; *Penetanguishene*—Nuisances investigated and removed ; *Cornwall*—The Board's sanction asked re the building of a slaughter-house ; *Carden Township*—Investigation into a case of Smallpox ; *Woodville*—Investigation into outbreak of Typhoid Fever ; *Galt*—Mill Creek nuisance investigation ; *Waterloo Township*—Polluted creek nuisance investigated ; *Bridgport*—Nuisance investigated ; *Hamilton*—Correspondence re disposal of excreta ; *Toronto*—Ashbridge's Bay investigation.

Besides the above a large number of sanitary matters of minor importance received the special attention of the Secretary of the Board, and when we say that nearly one thousand letters and six hundred postal cards were written to Municipal Clerks, Medical Health Officers and other sanitary authorities, the public will have sufficient proof of the interest manifested in public health work, not only by the Provincial Board of Health, but by Local Boards throughout the Province.

We must now refer shortly to the outbreak of Smallpox in Hungerford Township, Hastings County. In the month of November a disease broke out in this township which was thought to be that of Smallpox. The Secretary of the Board was telegraphed for to come and investigate the matter. He arrived there on the 19th of the month, the day after the receipt of the telegram, and ascertained that Smallpox was prevailing to an alarming extent. Owing to the wide prevalence of the disease, the Secretary was directed by the Board and authorized by the Minister to take whatever measures were necessary in aiding the local authorities to stamp out the disease. In a few days a system of inspection had been instituted, with two medical men, appointed by the Board, to co-operate with the Local Board of Health, for the purpose of confining the disease. Owing, however, to the panic, these duties were of the most fatiguing kind, but by the indomitable perseverance of the assistants, success eventually crowned the efforts of the Secretary and staff. It is unnecessary to here particularize each item of the precautionary measures adopted—the medicines and vaccine virus sent into the townships and the large number of the people that were vaccinated. There can be little doubt but that, had this Board not been in existence to deal with this outbreak, and had the old system of Municipal Committees still existed without any central authority to aid and direct, the disease would have become general throughout the Province.

In consequence of the experience gained by the Hungerford outbreak of the necessity for further legislation in regard to epidemics, "An Act to make further provision regarding the Public Health" was passed by the Legislature during the session of 1885, dealing with the appointment of Medical Health Officers, their powers and duties, with removal of nuisances, etc., etc. This Act was distributed to all the Secretaries of Local Boards in Ontario and to the Clerks of Councils not as yet having complied with the law in forming Local Boards. There are large powers conferred upon Local Health authorities, which will have the effect of making them understand better than hitherto the health laws, and the way in which their enforcement will be effectual and best calculated to promote

the interests of health under their jurisdiction. Throughout the greater part of the year, the Provincial Board was engaged in superintending the work of the large number of Local Boards which had been formed during the past two years, carrying on extensive correspondence with their members and Medical Health Officers, and investigations into the causes of and suggestions of methods of procedure for averting the progress of epidemic diseases. Sanitary information was this year, as in the preceding three years, largely circulated throughout the Province, and the disease reports received from local medical practitioners were carefully tabulated and utilized in the Report for the year. During the year there were 570 Local Boards established, 298 medical health officers and 200 sanitary inspectors appointed, which shews a large increase over 1884. The reports from Local Boards at the end of the year shewed clearly the extended and gratifying progress made in public health work over other years.

What the Board was called upon to do in relation to unsanitary conditions or nuisances was similar in character to its work of the preceding year. Some complaints about cheese factories were made to the Secretary, which were referred to the local authorities to be dealt with, and from the action which the Board has taken in reference to this matter, it is confidently expected that sanitary laws relating to these factories will receive greater attention in future.

The slaughter-house nuisance is yearly receiving increased attention from Local Boards of Health, and the law respecting them contained in the Act of 1884, is becoming more appreciated by the general public, who are anxious to have it enforced, thus lessening what in former years have been serious nuisances and menaces to the public health.

The complaints of the manner in which fat rendering establishments and knackeries are being conducted as detrimental to the health of those working in them and those residing in their vicinity, have been numerous and received the attention of the Board. The law in regard to this class of nuisances—vide Sec. 37, Public Health Act, 1884—is rather cumbersome and expensive and should be amended.

Epidemics of different diseases were not so numerous as in 1884, although diphtheria and typhoid fever made their appearance in several parts of the Province, to a somewhat alarming extent. In the early part of the year a few cases of smallpox occurred in several of the townships contiguous to those of Hungerford and Elzevir, (the principal battle ground of the outbreak of 1884,) having their origin in cases of this disease continuing from that year. These cases were not allowed to spread to any alarming extent, the local authorities having acted promptly on advice tendered them by the Secretary of the Board. On the 16th of May a circular was issued to the various municipalities in Ontario, calling upon them to put in force the powers contained in Cap. 191, R. S. O., respecting vaccination, and in over one hundred different places a general system of vaccination was inaugurated and carried out. This was highly satisfactory and timely, in view of the fact that smallpox had then spread in some degree in Montreal, and had likewise the effect of promoting a feeling of comparative security in our people when they subsequently became aware of the great danger that threatened that city and this and other Provinces.

By July the Montreal outbreak had assumed serious proportions, but in the meantime the Board had been busy devising means by which our Province could be best protected against the disease should it invade the Province. After the conference arranged for by various interests had been held in Montreal, in the end of August, and at which this Board was represented by the Chairman, the outlook appeared so serious that the Government, acceding to the request of the Board, passed by Order in Council the Smallpox Regulations, dated Sept, 5th, 1885.

This scheme, in brief, included in the Regulations, consisted of the appointment of an efficient staff of medical inspectors, the chief of the staff residing in Montreal. The other members of the staff were detailed to board trains and boats bound for any part of Ontario, and had instructions to inspect passengers and freight, to see if the former showed any symptoms of Smallpox or required vaccinating, and if the latter required disinfection. They also had instructions to arrest, on entering Ontario territory, any person who declined to be vaccinated and who failed to show marks of the operation having been recently and successfully performed. It is needless in this article

to recapitulate every effort that in the end turned out so successful in preventing, with but comparatively few exceptions, the importation of the contagion of this fatal disease. The whole result may be summed up by simply stating that in this Province, up to the end of December, 1885, there were only 146 cases of Smallpox, growing out of forty-two cases of imported disease, (seventeen of which were prior to inspection, and twenty-five after,) and only sixteen deaths; while in Montreal city alone, up to and including the same period of time, there were 3,175 deaths from the disease. When we consider that out of the 110,000 passengers leaving Montreal in the months of September, October, November and December, and the large amount of luggage and merchandise accompanying them, there were imported only sixteen cases of the disease from infection of the person, only two from the luggage or clothing, and only one from merchandise, it will at once be apparent that the efforts put forth by the Provincial Board of Health to save the Province, were eminently successful and far exceeded the most favourable anticipation of the Board.

Regarding public health work in 1886, but little needs to be added to what has been written in previous pages of this report in addition to the accompanying appendices. As stated in the Introduction, the year has shown a steady progress in internal organization of the Province. As 610 municipalities reported Local Boards during this year, it may be said, that nominally, at any rate, every municipality has its health organization, and as happened in several instances, where a case of Smallpox has occurred, they have been proven to be prompt and efficient in dealing with the outbreak of this disease. Routine health work in the field of nuisances has steadily progressed in incorporated municipalities, and many rural municipalities are earnestly engaging in sanitary work. The Meeting of the American Public Health Association, while promotive of health work in Ontario, is one of the best evidences, not only of interest evinced by the Government and of the Board, in inviting the Association to Canada, but also of the influence which the Canadian factor in American continental health work has in this International Association. Growing out of this meeting has been formed an Association of Executive Health Officers for Ontario, which there can be no doubt, is destined—if its counsels are wise, and its councillors true to their self-imposed task—to exert an important influence upon future Provincial, but especially municipal health work and legislation.

To sum up, in conclusion, I think it must be granted that, as shown in this *resumé*, Ontario is to be congratulated in this, as in many other of the steps in social progress, which she has taken in advance of the other Provinces of the Confederation, and in the progress which she has made, as compared with any other state organization on the continent during the period since her Provincial Board has been in existence. As expressed by a prominent member of the House in 1882, when the Board was instituted, the organization was tentative, and its existence and success will depend upon the energy which is shown by the Board and its officers. Five years have shown that energy and enthusiasm can make an experiment a success, a potentiality a finality, a then localized organization of six, a homogeneous health organization, co-extensive with the limits of this Province, and embracing as active workers, at any moment that an epidemic may appear, an army of over 3,000 men, exclusive of some 500 regularly commissioned officers. During the four sessions since its organization, three Health Acts have been placed on the Statute book, and an amendment to the law relating to vaccination, all directly tending to make the relations between the central and local authorities more intimate. The relative limits of their respective works have become better defined, defects in municipal laws as regards nuisances, in some measure remedied, powers, as relating to the management of epidemics enlarged, and the range of matters included within the province of health work more extended. While the life of the individual has in certain directions become more protected than formerly, no limitation of any legitimate well-conducted industry has occurred; but, on the contrary, it has been possible to show, and in some measure teach the public to understand, that every industry becomes commercially more successful, to the extent that it is scientifically conducted, with due regard to the health of the operatives, the cleanliness of materials, and the more complete utilization of its by-products.

Suffice it to say that private opinion, public sentiment, and legislative enactments, have all developed so strongly in favour of health boards, central and local, that matters at first thought beyond the bounds of health laws, have been brought within their

ordinary limits, that ends thought impossible of accomplishment, have now become practicable, and hopes timidly expressed have been more than realized. If the country is satisfied with the experiment—and it is, as must be judged by representative statements in Parliament—then it would seem only proper and becoming that we, to whom such hearty sympathy and support have been accorded, in the conduct of matters hardly ever agreeable, and often extremely unpleasant, pursue with careful diligence the work laid upon us, and endeavour to perfect and fix on yet firmer foundations this gauge of a people's happiness—the measure of the public health. Let us take as our motto—

“Count nothing done while aught remains to do.” (*“Nil actum reputans dum quid superesset agendum.”*)

IV.—DIPHTHERIA IN ITS SANITARY RELATIONS.

The History, Immediate Cause, Exciting Causes, and Limitation of Diphtheria.

Under ordinary circumstances the remarks already made in Section I., which includes the history of the Board's work during the year in relation to epidemic diseases, would have been deemed sufficient in regard to this as to the other contagious diseases; but the unfortunate prevalence of Diphtheria during the whole past year to an extent unprecedented and, indeed, unequalled in the history of the Province, would seem not only sufficient excuse for devoting some more extended remarks to it, but would also appear a special reason impelling such, with the hope that individuals, the public generally, Boards of Health, Local and Provincial, as well as our Legislature, may be led to consider the means which seems most likely to aid in limiting the spread, lessening the fatality, and diminishing the enormous financial loss which, in the aggregate, is involved in dealing with this much dreaded disease.

1. *History of the Disease.*

(a) *Medical History of the Disease.*—Allowing for the limited knowledge and crude expressions regarding disease in general in past ages, historical evidence leads to the conclusion that Diphtheria has existed since very early times—as, indeed, its supposed cause at all times connects it with aggregations of people in more or less limited spaces. As “Syriac ulcer,” Aretaeus of Cappadocia describes a disease commonly supposed to have been Diphtheria. Little accurate was said about it by any of the writers in the Middle Ages; but since 1500 A.D. evident reference to it has been made by writers of Holland, France, Germany, Spain and Italy. After 1600 A.D. references are made to it by English, Swedish, Dutch and American writers.

It thus appears that in climates as far south as Eastern India and Greece, since early writers of both were the first to describe it, and as far to the north as England and Sweden, this disease has been known and epidemics of Diphtheria have occurred.

Its modern history may, however, be said to have begun when Bretonneau, in 1821, asserted the identity of Angina Maligna (Diphtheria) with Membranous Croup. He referred to the continuity of exudation, or false membrane of the nose, pharynx and respiratory tract, and asserted that it was a specific disease and not to be confounded with catarrhal or scarlatinal inflammation. He considered it in large measure a local disease. Since his time more and more has yearly been written on the subject, English authorities, up to recent years, disputing the identity between the pharyngeal and laryngeal diseases. Almost all recent pathologists are, however, agreed as to the identity of the pathological processes in the two forms of the disease.

(b) *History from Statistics and Death Returns.*—In so far as the disease can be studied in this way, especially in connection with death returns of countries, districts, towns, cities, etc., and especially in relation to climate, season, etc., it will be evident that for sanitary purposes such an investigation would be of the greatest value. As Hirsch has expressed it, regarding the goal of all historico-pathological and geographico-pathological enquiry:—“The full aim and object of such enquiry is to exhibit the particular circumstances under which diseases have occurred within the several periods of time and at

various parts of the globe ; to show whether they have been subject to any differences and of what kind, according to the time and the place ; what causal relations exist between the factors of disease acting at particular times and in particular places on the one hand, and the character of the diseases that have actually occurred on the other ; and finally, to show how those diseases are related to one another in their prevalence through time and space."

Unfortunately, as regards Diphtheria, the opportunities for such historical studies have been extremely limited up to the most recent times. This has doubtless been in large degree due, not more to the imperfect character of past records than to the opposing views regarding the real nature of the disease.

Within the last ten years, however, with the increase of established systems of registration in various countries, and with the more accurate knowledge and diagnosis of the disease, such data have gradually been accumulating as enable us to gain some tolerably complete idea of the position which Diphtheria holds amongst the causes of mortality, and of the enormous importance which an increase or decrease of its prevalence must have upon the health and prosperity of any community. For the purpose of illustrating its prevalence I have, with some searching, been able to present the following extended statistics which, though manifestly imperfect, yet contain much valuable information :—

TABLE showing the Prevalence of Diphtheria per 1,000 of Population for different years.

LOCALITY.	YEAR.	POPULATION.	TOTAL DEATHS.	RATE PER 1,000.
England and Wales [D. & C.].....	1884	27,132,449	10,768	.39
Principal Towns in 11 English Districts.. [D. & C.]	1884	12,968,352	5,248	.40
London [D. & C.]	1884	4,019,361	2,037	.49
Glasgow [D. & C.].....	1880-1885	534,334 (mean)	292 (mean)	.54
Fifty Cities in United States—situated in 21 Grand Groups [D. & C.]	Census year ending June 1, '80.	7,790,859	9,330	1.19
Nine American States—(15 years' returns)[D.].....	For Total of 15 years.....	14,110,365	16,072	.71
American Cities :				
Baltimore [D. & C.]..... {	1885	417,220	400	.95
	1886		190	.45
St. Louis [D.]	1885	400,000	372	.93
	1886		719	1.79
Chicago [D. & C.]	1885	630,000	1,012	1.60
	1886	700,000	1,273	1.64
New York [D.]..... {	1885	1,397,395	1,325	.94
	1886	1,439,037	1,727	1.20
Brooklyn [D. & C.]..... {	1885	664,602	832	1.25
	1871-1881		average.	1.81
Ontario [D.].....	1881-1885	1,923,610 (census 1881)	4,793	.50
Ontario (based on return of first half-year)	1886		1,470	.76
Ten Cities of Ontario (Registrar-General's Returns) [D.]	1881-1885		789	.50
Ten Cities of Ontario [D.].....	1886		342	.75

In the above Table those returns in which Group is included with Diphtheria have D. & C. in brackets.

DIAGRAM I.

Showing Prevalence of Diphtheria in 1884 in Eleven Grand Districts in England, giving the average death-rate of the aggregate totals for 1,000 of the population.

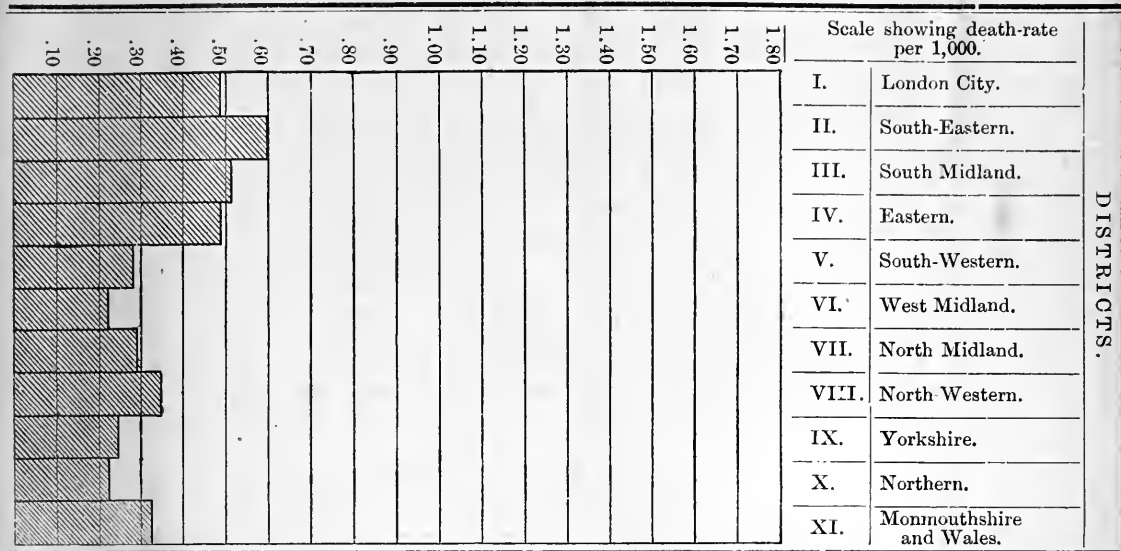
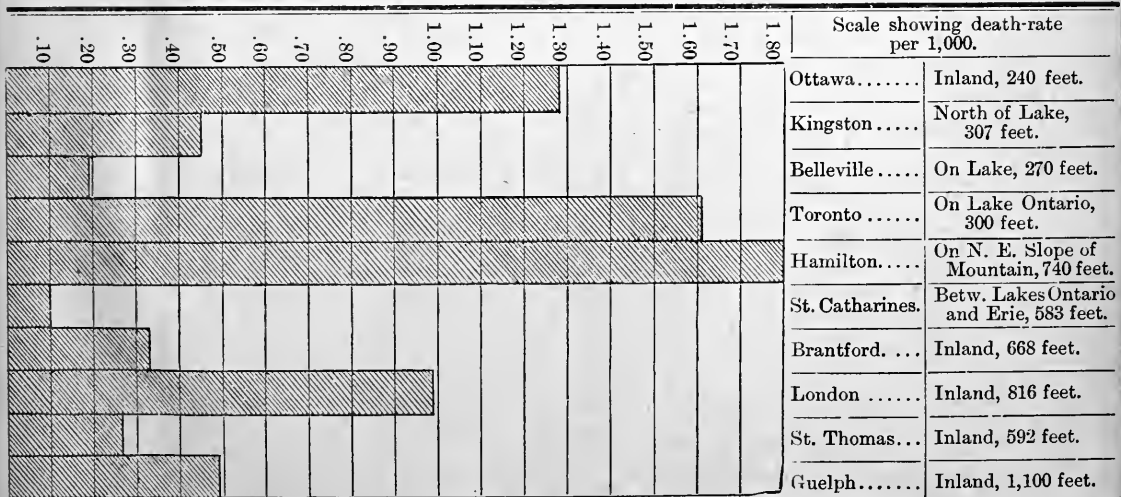


DIAGRAM II.

Shewing Prevalence of Diphtheria in 1886 in Ten Cities in Ontario, giving the death-rate for every 1,000 of the Population, and the Height above Sea-level.



From this summary of the extended tables which follow, we gather a few points which are perfectly apparent. The first of these is the fact that comparatively Diphtheria is much more prevalent in American than in English cities. Why this is does not appear very clear; but for the present it is sufficient that we note the fact. It further appears that, taken as a whole, the two largest English cities have a greater average prevalence than the average for all England. But, should we assume to associate this with the fact of over-crowding, we would find, from a close examination of Table III., that there are other English districts and smaller towns in which the disease has more than the average of prevalence. Similarly we notice that several of the largest American cities have a much higher degree of prevalence than that given as common to the fifty cities in the different groups, and very much higher than the average as given for the total of nine states. This much I think may fairly be stated as a general fact, even though a liberal allowance is made for imperfect state registration. Another fact which seems proved is that aggregations of people do not increase the mortality from Diphtheria, since in Ontario, taking the Registrar General's statistics for the years 1881-1885, the total deaths for the ten cities present exactly the same average as for the whole Province. The same fact would seem to be proved from the returns for 1886, as far as can be calculated, were it not that the population adopted in the Provincial returns is that of the Census of 1881, while that of the ten cities is presumed to be taken from the last municipal assessment. Allowing for equally incomplete registration, it is further apparent that the nine states show a total average prevalence much the same as that for Ontario. From the tables of returns of several of the largest American cities in most recent years, I think we may conclude that where registration is practically perfect as in them, we have the correct gauge of the prevalence of the disease on this continent in centres of population; since taking the individual returns of the ten cities of Ontario for 1886, where returns are similarly complete, we find that Ottawa, Toronto and Hamilton have an almost equal death rate. From monthly returns, from time to time received from other American cities, as St. Paul, Milwaukee, Detroit, Cleveland, Rochester, etc., a rate practically the same as the foregoing may be calculated. While, as will be seen further on, there might be some reason to suppose that north temperate climates in America have the disease in greater prevalence than more southerly latitudes, still, judging from the returns from Baltimore and St. Louis, the disease cannot be said to vary greatly in them from the prevalence in New York and Brooklyn. Further, we may fairly say that sea-board cities are not scourged to an extent greater than cities inland, as Chicago, Milwaukee, St. Paul or St. Louis.

Regarding the District prevalence of Diphtheria in England, as shown in the above Diagram I. (Table I. Appendix), I cannot do better than quote from the Registrar-General's report:—

"There are manifestly some counties that are much more liable to Diphtheria than others, and, if the counties with high rates be distinguished by shading an outline map of the Kingdom, it will be seen that there are two tolerably definite areas in which this disease apparently finds its most suitable home. The one has its base in the south-eastern counties, Sussex, Hampshire, Surrey and Kent, and stretches upwards along the eastern side of England, through Middlesex, Hertfordshire, Essex, Cambridgeshire and Bedfordshire, occasionally reaching Norfolk, Nottinghamshire and Lincolnshire; while the other area has its nucleus in North Wales and Shropshire, and tends to spread through Herefordshire and other bordering counties, as also in some years into South Wales, Monmouthshire and even across the Bristol Channel into Somersetshire. The extent to which Diphtheria spreads over these two areas differs very considerably in different years.

"In 1884 the area which was extensively invaded was what may be called the South-Eastern Diphtheritic region, where a compact area, consisting of London and eleven registration counties, had rates above the general average, while in the Western or Welsh Diphtheritic region the disease was confined within comparatively limited boundaries, the only registration counties besides North Wales and Shropshire in which the rate exceeded the average for the whole country being Somersetshire and Dorsetshire. The high rate in this last mentioned county was quite an exceptional incident, and the disease

may have spread into it either from Somersetshire, where the rate had been high for three successive years, or from Hampshire, where there had been a high rate for four years in succession; Dorsetshire forming a link that connects the Eastern and the Western Diphtheritic areas, and so being liable to infection from either."

In Diagram II. (Table II. Appendix) found above, the assumed necessary correction has been applied and the results must be assumed to be tolerably complete. It has been difficult and, indeed, is quite impossible, to separate the groups by any physical differences sufficiently marked to enable us to make safe comparisons. In a general way it may be said that cities in the more southerly groups have less Diphtheria than those further north; that the northern Atlantic cities and those on the great lakes have a greater prevalence of the disease than some of those inland; and that the Pacific coast suffers less from the disease than places in the mountains, as Denver. This seeming immunity of California is apparently due to incomplete registrations in 1880; since, the examination of monthly reports from cities shows the disease to have been prevalent in unusual degree in 1886. It is remarkable that a town such as Denver, 5,212 feet above the sea-level, a reputed health resort, should show so high a prevalence of the disease. This table, as is evident, cannot be considered very satisfactory.

Diagram III. (Table III. Appendix), manifestly very incomplete, is for Diphtheria alone, not including Croup. It is important as illustrating how much needs to be done ere we can make a satisfactory study of the conditions favoring or retarding disease. We can gather from it that while there is on the whole considerable difference between states, yet the aggregate total of deaths in 14,110,365 of a population is enormous; and further, that while in Massachusetts there has been on the whole a decided decline in prevalence in recent years, Michigan returns tend to show an increase. In the two cases there is, in all probability, an explanation beneath the surface. In the first political changes made registrations to be less carefully attended to, while in Michigan there has been a steady improvement in the registration returns.

Table IV., found in the Appendix, as already remarked, is most valuable, since it notes the present range of the disease in almost perfect systems of registration, while comparisons for the various months throughout the year, as in the case of Brooklyn, can be made. They give a satisfactory showing as far as the general tendency to a restriction of the disease goes; but they show equally—a fact which we have mentioned in our introduction to this article, viz., that 1886 has had an enormous fatality from this disease, amounting in some instances to nearly 2.00 per 1,000.

Regarding Table V., found in the Appendix, I quote from the Annual Report of the Registrar-General:—

"The deaths from Diphtheria, the principal disease in this class, have largely increased. In some counties it was quite epidemic, particularly in Essex, Leeds and Grenville (united), Wentworth, and Prescott and Russell. In the latter county the mortality from this disease was very high—134 deaths with a ratio of 3.35 per 1,000. It was also above the average, .52 per 1,000 in the following counties:—Carleton, .65 per 1,000; Hastings, .63; Simcoe, .64; Stormont, Dundas and Glengarry, .70 and York, .65. Increased returns of deaths from this cause were received from 22 out of the 39 counties of the Province."

"The discussion of the cause of this sudden increase in the deaths from Diphtheria in the Province, is not within the province of a Report on Vital Statistics, but rather within that of the Provincial Board of Health. Most assuredly, however, the startling figures demand serious consideration. Deducting the population in the cities and towns, also the deaths from Diphtheria in those places, from the totals for the whole Province, the following results appear:—The deaths from Diphtheria in the cities and towns were 289 or 4.2 per cent. of all the deaths in those places and the ratio to 1,000 living was .74. In the remaining or suburban parts of the Province the deaths from this cause were 717 or 4.7 per cent. of all the deaths, but the ratio to 1,000 living was only .46, shewing that the mortality from Diphtheria is greater in the cities than in the rural districts. Carrying

out this comparison for the last five years the results are nearly the same. Deaths from Diphtheria in the Province exclusive of the cities in the last five years numbered 4,004, or an average ratio of .47 per 1,000; for the cities, during the same period they were 789 with an average ratio of .61 per 1,000.

Mortuary Statistics of Diphtheria in the Cities of Ontario for the five years ending 31st December, 1885.

CITIES.	1881.		1882.		1883.		1884.		1885.		TOTALS.	
	Deaths.	Rate per 1,000.	Deaths.	Rate per 1,000.	Deaths.	Rate per 1,000.	Deaths.	Rate per 1,000.	Deaths.	Rate per 1,000.	Deaths.	Average Rate per 1,000.
Toronto	44	.5	57	.6	58	.6	27	.2	86	.7	272	.5
Hamilton	9	.2	12	.3	2	.06	50	1.2	59	1.4	132	.6
Ottawa	81	3.0	60	2.1	30	1.0	7	.2	34	1.0	212	1.4
London	4	.2	3	.1	2	.1	4	.2	11	.3	24	.2
Kingston	1	.07	7	.5	0	.0	5	.3	4	.2	17	.2
Brantford	5	.5	4	.4	18	2.0	7	.6	4	.3	38	.7
St. Catharines	8	.8	3	.3	0	.0	1	.1	3	.3	15	.3
Guelph	10	1.0	9	.9	4	.4	7	.6	8	.7	38	.7
Belleville	3	.3	4	.4	0	.0	2	.2	3	.2	12	.2
St. Thomas	0	.0	5	.6	0	.0	5	.4	10	.8	20	.3
Stratford	4	.4	0	.0	2	.2	1	.1	2	.2	9	.2
Totals and average rates per 1,000.	169	.7	164	.5	116	.4	116	.4	224	.7	789	.5

Diphtheria in 1886.

CITIES.	Height above sea level in feet.	POPULATION.	DEATHS.	Rate per 1,000 of population.
Ottawa	240	32,857	42	1.28
Kingston	307	15,109	7	.46
Belleville	270	10,171	2	.19
Toronto	300	111,800	181	1.61
Hamilton	740	39,985	71	1.80
St. Catharines	583	9,882	1	.10
Brantford	512	12,167	4	.33
London	816	26,254	26	.98
St. Thomas	592	11,157	3	.26
Stratford	1,185	9,069	No returns.	
Guelph	1,100	10,134	5	.49

(NOTE.—*Membranous Croup* is not included with *Diphtheria* in these Tables.)

From this table the most that can be said is that it gives us no positive information regarding the exciting causes of the disease, since until within the past two or three years the death returns were not perfect; while some of the larger cities which in 1886 had the highest death-rate from Diphtheria, appear,—if we except Ottawa in previous years—but slightly if at all above the average. One thing, however, abundantly apparent, is that this table, as well as most returns from American cities, show an enormous advance of the disease during 1886. For instance, taking roughly the total returns from the American cities of which statistics are given and the total for this Province, as representing deaths in a population of 8,000,000, of which Ontario forms one-fifth, and allowing for an advance in deaths from Diphtheria amounting to .25 per 1,000 of population, the total number of deaths above the average in the population is 2,000, which at the mortality rate of 30 per cent. to the number of cases of the diseases, means 6,000 cases at least.

(c) *Prevalence of the Disease from cases reported.*—What has been said regarding the imperfect character of mortuary returns may with a few exceptions be repeated with emphasis regarding a true estimation of the prevalence of the disease from reports of cases. There are several reasons why this should be so. While in the first instance, correct reports depend upon correctness of medical diagnosis, they depend to an equally great extent upon compliance with laws regarding the notification of infectious diseases by physicians, associated with similar compliance on the part of householders. From what can be gathered it would seem that in the several American cities, returns from which are given, (*vide* Table IV, appendix) the average thoroughness of notification varies considerably—unless we assume that relatively the proportion of deaths to cases varies greatly. One principal reason for supposing that the relative difference lies in the different degrees in which notification is carried out, is in the fact illustrated by the returns from Brooklyn and New York.

Thus in 1885 Brooklyn had reported	2.02 cases per 1,000 of populations with death rate..	.78=38%
“ 1885 New York “	2.09 “ “	.. .94=44
“ 1886 “ “	2.60 “ “	.. 1.20=46

The large number of fatal cases, to those reported in each instance, the repetition in New York, of practically the same proportion between cases and deaths in two successive years, the close proximity of the two cities, placing climate out of the question, leads one to the conclusion that the compliance with the law in Brooklyn is considerably more perfect than in New York.

In reply to a circular issued to Medical Health Officers in Ontario, in September, 1886, some 138 answers were received. In these reports the remark is again and again repeated that the notification of cases is most imperfect. The proportion of deaths to cases given by these reporters is seen in the following table :—

NUMBER OF REPORTERS.	TOTAL CASES REPORTED.	TOTAL DEATHS REPORTED.	AVERAGE PERCENTAGE OF DEATHS.
138	1,149	328	28½

The obvious effect of such imperfect notification is on the one hand to cause the fatality from the disease to appear appalling, and create an almost hopeless opinion on the part of the physician and public regarding any attempts at its treatment; and on the other hand to hide the actual prevalence of the disease in any community, the degree to which the economic loss from its prevalence extends, and the undeterminable debility and permanent injury to health of the survivors.

In order to attempt the determination of these two or three latter points a circular was prepared and forwarded to the physicians of Toronto. Assuming the correctness of the returns in every instance the following facts regarding the prevalence of the disease in 1886 were obtained :—

19 reporters ; 278 cases (average 16.5) ; average attendance, 7 days ; deaths, 1 in 10.

From the Toronto returns, as far as complete, it is abundantly plain that were the notification of Diphtheria thoroughly carried out, the proportion of deaths to cases would not present the same high total as in the mortality returns already quoted. This showing from physicians' returns, may be said to be due both to differences found in the type of the disease during different outbreaks, and to the varying degrees of severity of the disease at different seasons of the year. While, doubtless, it may be in some degree true that the mortality varies in different outbreaks of Diphtheria, as in other zymotics, and at different seasons of the year, I think it will be the experience of every physician that severe cases occur in every outbreak, and that, at such time as the public alarm becomes more general and cases are taken earlier to the physician, the mortality shortly thereafter declines. Speaking of the disease during the past and

other years, my personal experience has been that cases were as severe in July and August as in December.

The following table well illustrates this fact :—

Table showing Proportion of Deaths to Cases Reported.

LOCALITY.	Jan.	Feb.	March.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
ST. LOUIS. 1 death to	3 $\frac{1}{2}$	3 $\frac{3}{4}$	2 $\frac{1}{2}$	4	4	3	3	3	3 $\frac{1}{2}$	4	5	4 $\frac{1}{2}$
NEW YORK. 1 death to	2 $\frac{1}{2}$	2 $\frac{1}{10}$	2 $\frac{1}{2}$	2 $\frac{1}{2}$	2 $\frac{1}{2}$	2 $\frac{1}{2}$	2 $\frac{1}{2}$	1 $\frac{3}{4}$	2	1 $\frac{5}{6}$	2 $\frac{1}{2}$	2 $\frac{3}{4}$

The monthly incidence of the disease is a matter of interest in studying the disease in connection with causes, such as will be mentioned more particularly later on. There seems to be a tolerably general law governing its increase after an invariably healthier period occurring irregularly during the summer months.

Table showing Deaths by Months.

PLACE.	Jan.	Feb.	March.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
Baltimore, 1885.	27	10	11	11	10	10	8	7	17	32	30	17
St. Louis, 1885-1886. . .	74	52	64	41	41	53	58	89	129	161	178	151
Chicago, 1885-1886. . . .	149	109	102	128	118	114	87	119	137	186	218	183
New York, 1885-1886. . .	263	270	255	239	244	245	234	175	172	252	310	393
Ontario, 1885	87	70	100	64	62	53	64	62	81	91	129	132

From the table just given it would appear that with August at times, but especially with September, the increase of mortality from Diphtheria begins, usually reaching its height in November. At this point it remains stationary or declines somewhat, albeit in January and March there is occasionally a notable prevalence of the disease.

2. Distribution of Diphtheria.

(a) *Geographical Distribution.*—In the numerous statistics of Diphtheria given in the Diagrams and Tables, I have endeavoured to show the extent of prevalence of the disease in countries, states, and cities from which statistics of cases and deaths were obtainable. From Hirsch's invaluable hand-book already referred to, I propose to give a few illustrations of the *pandemic* character of the disease, and of its having the characteristics peculiar to epidemic diseases. He says: "The history shows us also a peculiarity in the comportment of Diphtheria as an epidemic, which distinguishes no other epidemic disease in so decided a manner. I mean the cyclic character of its epidemic or pandemic recurrences, a character which comes out very definitely in the historical sketch just given. The several cycles have extended over periods of various lengths, many of them only a few years and others lasting several decades." Without referring to the imperfect history

of past centuries I have to quote Hirsch's remarks : " That certainly as regards our own time we have to deal with a new general outbreak of the disease ; . . . but it is borne out also by the almost unanimous opinion of the most experienced observers of our day, that the disease in its epidemic outbreaks came upon them as an absolutely new thing." " This new era in the history of Angina Maligna (Diphtheria) begins, for the larger part of Europe and North America, at almost all points with the years 1857 and 1858, a little earlier in some countries than in others ; and it is certainly a very notable thing that the time of its first appearance as an epidemic in distant parts of the world, such as India, China, Australia, Polynesia, Tunis, and the like, coincides with the outbreak in the regions mentioned. The disease showed itself, accordingly, in the form of a typical pandemic, in the strictest sense of the word. Of its starting point we can form no opinion, although there is no doubt that some parts of this great world's pestilence were dependent on other parts of it through the medium of a communicable morbid poison." Next to France in the order of being invaded comes the Iberian Peninsula, Holland and England ; then Germany, Russia, and North America ; a little later the Scandinavian Kingdoms ; and lastly Italy and the south-east of Europe." I may remark in passing that Hirsch's quotations from many prominent local writers in France and elsewhere, show that the disease exhibited there, what we have noticed concerning it at the present day viz., that the dates of its appearance in different regions comparatively contiguous have, again and again been separated by intervals of several years—pointing out the fact of these outbreaks being through the medium of a communicable morbid poison. This peculiarity of the disease is shown further in the fact that the spread was not sudden but gradual in almost every case cited. Thus in Holland in 1859-63, amongst a population of 3,000,000 there were only 1,973 deaths, or 400 per annum ; in 1866-70 they numbered 2,914, or a yearly average of 600. As shown in the English statistics given for 1884, the south-eastern counties to-day show more than an average prevalence of the disease ; while, as Hirsch states, it was supposed to have been introduced to England from Boulogne in 1857, and the first cases occurred in London and the southern counties of Kent, Essex, Surrey, Hampshire, Devon and Cornwall. Within two years it had spread to Scotland. According to Christison the disease had acquired the character of an epidemic by 1863. Localized epidemics appeared from time to time in Scotland up to 1875. Similar statements are made by Hirsch regarding the progress of the disease in Germany since 1856, and he remarks regarding a number of places where it appeared in those years, that for the most part they have become permanent seats of Diphtheria.

In the countries of Austro-Hungary it spread with extreme slowness, and not till 1875 did the disease become epidemic for the first time in Vienna.

Appearing noticeably in Southern Russia in 1872, it had spread widely and very destructively by 1879. " The victims were numbered in every village by the hundred, and in every *commune* by the thousand. The children were exterminated."

In Sweden, from 1863 to 1870, the cases officially reported numbered 18,156, of which 4,176 were fatal ; in Norway, from 1866 to 1870, there were 9,122 cases, and 1,649 deaths. Both in 1856 and 1860 it appeared in Iceland, and, more or less, completely overran the whole island. From 1861 to 1871 it prevailed with greater or less intensity in different years, over nearly all Italy, and in recent years has appeared extensively both in Greece and Turkey.

Since 1856 it has become generally diffused over North America, and as we now know, has tended to increase rather than diminish under the ordinary municipal regulations regarding it. In South America it seems to have been prevalent in certain quarters, even earlier than 1858. It has appeared at various points on the coast of Africa, more noticeably in the southern, more temperate portions ; but in the Northern French provinces it has at times been very fatal. Disastrous outbreaks have occurred in Syria and Persia ; while India and China have not been free from it. In 1866 it appeared with frightful violence in Peking, causing, it is estimated, 25,000 deaths. The years 1858-60 saw it more or less prevalent in Tasmania and Australia. From these abstracts the extent and persistence, as well as the peculiar characteristics of the disease as regards its spread, are well set forth. *No country is free from it, and no climate is fatal to its existence if once introduced.*

(b) *Local Distribution.*—Many factors seem to enter into the discussion of this part of the subject. At times it has seemed as if it was a disease peculiar to the lower strata of society who exist in the poorer and less sanitary portions of a town, or in filthy farm-houses with unsanitary surroundings; but its frequent incidence amongst those classes of a city, supposed to be in large measure free from similar surroundings, has led to the denial of the first assertion. For instance, Thoresen, in his account of an epidemic in Norway in 1861, is quoted as saying, "That bad sanitary conditions, such as unwholesome, damp, dingy and cramped dwellings, can add to the malignancy of the disease I do not wish to deny; but that it may be seen breaking out and assuming the worst type under circumstances the most favourable, while in small and poverty-stricken huts it runs a perfectly mild course—of that I have been convinced time after time." According to Hirsch, Seitz, of Munich, says: "Thus we see that the disease has existed for years here, among all circles of the inhabitants, both rich and poor, in families belonging to the aristocracy as well as those belonging to the working-classes." As to the value of these quotations from the sanitary standpoint we shall have something to say later on.

As will have been noted in the statistics of prevalence of the disease in America, Denver, 5,212 feet above the sea, had the highest mortality of any of the cities quoted, in 1880. Fatal epidemics on the slopes of the Himalayas have been recorded, and the highlands of Peru have not been free from its ravages. As regards its connection with certain geological formations, Hirsch quotes Geissler in his history of Diphtheria in Saxony as saying, "That any particular character of soil has afforded protection against the spread of the malady can nowhere be made out." Several cases, as that amongst the crews of American men-of-war in Chinese waters, have been recorded where the disease has become epidemic on ship-board. Notable instances have occurred within the past five years in Ontario, where the disease has for a time been unusually prevalent on the central plateau (1,000 feet above sea-level) of the Province, while in other instances decimating epidemics have occurred amongst children in settlements situated upon *gneissoid* strata and surrounded with the purest air blowing over the surrounding ever-green forests. Isolated farm-houses in healthy districts have time and again been visited with the disease, with apparently no trace of its having been introduced; and the suburban houses of gentlemen on lofty situations near Toronto have had fatal visitations of the disease, while within three-quarters of a mile, on the level below the hill, the homes of market-gardeners and milkmen, surrounded with organic accumulations, have borne what seemed a charmed immunity.

(c) *Distribution of the disease amongst individuals*—Everywhere the same statement is made that as a rule the disease presses with special fatality upon children, especially from three to ten years old; and yet notable instances are known to me wherein this apparent law has failed. During the recent outbreak in the Institution for the Blind at Brantford, while the disease began amongst the pupils in a lad of 15 years, the chief proportion of 25 cases occurred amongst those of more mature years.

No statistics that I am aware of show that it is more fatal to girls than to boys, or *vice versa*. It is stated, in quotations by Hirsch, regarding several epidemics in the United States that the negro children, living in most unsanitary conditions, have enjoyed practical immunity from the disease. In order to show the fallacy of this belief I have obtained the following facts from Dr. Steuart, Medical Health Officer, Baltimore:—

HEALTH DEPARTMENT, CITY HALL,
BALTIMORE, Feb. 21st and 23rd, 1887.

PETER H. BRYCE, M.D.,
Of Provincial Board of Health, Toronto, Canada.

MY DEAR DOCTOR,—Your esteemed favour of the 18th inst. was duly received to-day. I have never seen the statement, that the negro was "practically exempt from diphtheria" in the South. This is not the experience in Baltimore, as far as I am aware, and I am not prepared to accept it as a substantiated truth. I suspect that the exemption, if existing among the negroes of the South, before the war, was due to their healthful lives; living in the open air, and at night always sleeping near an open fire all the year round. Since writing the above, my secretary, Mr. A. R. Carter, has made for me the enclosed table, which speaks for itself, and I hope may prove satisfactory to you.

Very sincerely yours,

JAMES A. STEUART, M.D.,
Commissioner of Health and Registrar.

YEARS.	Deaths from Diphtheria. Whites.	Deaths from Diphtheria. Coloured.	Total Deaths from Diphtheria.	Total Mortality. Whites.	Total Mortality. Coloured.	Total Mortality, all Causes. Whites and Coloured.
1887..	360	63	423	6,059	1,851	7,910
1878..	262	41	303	5,159	1,574	6,733
1879..	262	36	298	5,883	1,735	7,618
1880..	263	30	293	6,170	1,873	8,043
1881..	552	87	639	6,719	2,097	8,816
1882..	607	100	707	6,878	2,045	8,923
1883..	520	71	591	7,125	2,255	9,380
1884..	317	26	343	6,398	1,895	8,293
1885..	243	9	252	6,324	1,829	8,153
1886..	179	11	190	6,477	1,862	8,339
Totals.....	3,565	474	4,039	63,192	19,016	82,208

Respectfully submitted,

A. N. CARTER,
Secretary.

Hirsch quotes Felix as stating, regarding the outbreak at Bucharest in 1868-69, that, "It is a striking thing that the Jewish population of the city (more than 14,000 in number) have remained almost exempt from the epidemic, notwithstanding the bad sanitary conditions under which most of them live."

An interesting fact in connection with the well-known prevalence of the disease in France is obtained from Ontario Statistics. In the most easterly townships of Ontario there is a very large proportion of French *habitants* from Quebec, while in the most westerly townships along the Detroit River is a large French population whose ancestors migrated there many generations ago. Diphtheria prevails in both these districts, to an unusual extent, as will be seen from the following figures:—

County.	Year.	Deaths from Diphtheria per 1,000 of population.
Prescott and Russell	1881-1885.....	1.2
“	1885.....	3.35
Essex.....	1881-1885.....	1.06
“	1885.....	1.92

Before, however, ascribing this prevalence in these districts to any racial tendency, the influence of the fact that the farm-houses and surroundings are not always of the best from a sanitary standpoint, must not be overlooked.

The general experience of physicians will in a large measure bear out Sir John Rose Cormack's statement that "Diphtheria is not a hereditary disease; but a special aptitude to receive and develop the poison evidently pertains to certain individuals and families. The statement is borne out by the statistical enquiries of Morelli, Nesti, and others, in relation to the recent epidemics of Florence; but the facts which establish it beyond a possibility of doubt are the numerous cases of particular families being desolated by diphtheria at intervals of years, and when the members attacked were widely separated." Making all due allowance for the possibility of contagion being carried in these supposedly separate outbreaks, as well as for the well-known mythical character of most popular reports of disease, there can be but little doubt that the scrofulous constitution, with a tendency to diseases of the lymphatics, is less likely to throw off the *materies morbi* of Diphtheria, once incepted, than would another with greater firmness of tissue. The same fact will likewise have been noticed in regard to the comparative immunity of physicians, while mothers and others continually exposed, or worn out with watching and anxiety, quite frequently become victims of the disease.

3. *The Etiology or Immediate Cause of the Disease.*—Of the many diseases which have within recent years come under the notice of physicians none has been, either as regards causation or treatment, surrounded with greater difficulties, or investigated with greater assiduity than Diphtheria. Regarding the diversity of views held by Bretonneau, and many eminent authorities since his time with reference to Diphtheria, Hirsch has said, "Into this chaos no light could come until medical science had advanced so far as to recognize that *causes of various kinds might underlie one and the same anatomical morbid process; and conversely, that one and the same morbid cause, operating in a given tissue, may be able to call forth, under varying circumstances, nosological forms of different sorts.*" Amongst the most recent and scientific attempts at isolating the specific *causa morbi* of Diphtheria, are the experiments carried out on the one hand by Wood and Formad in America, under the authority of the National Board of Health, in 1881, and on the other by Dr. Loeffler in Germany, in 1884.

I propose to give the results of these various experiments only so far as they seem to me to be definite and practical. It seems hardly necessary to state that, knowing as we do so well the infective nature of the diphtheritic exudation, inoculation experiments by several investigators have shown that the disease may be artificially produced. But as I propose to show from extended quotations from Dr. Loëffler of the only thorough experiments made with the view of isolating the *specific* cause of the disease the question of the unity of species of the living organisms causing the disease, has, as far as I am aware, approached a solution only since the date of his brilliant investigations.

As might be expected, the chief primary difficulty of the investigation lies in the fact that the mucous membrane of the whole respiratory tract must become the receptacle of whatever microbes may exist in inhaled air.

Oërtel has described the *micrococcus diphtheriæ*, as also Eberth and Klebs; Ewart and Simpson have found a spore-forming bacillus on the tonsils, as also Dr. H. C. Wood, Baltimore; Letzerich describes the specific diphtheritic microbe as a true hyphomycetous fungus; while Laycock described the specific organism as the oidium albicans. The total result of these varied assertions is, however, contained in Loëffler's remark: "Of course no satisfactory conclusions could be drawn from inoculations with the cultivation of impure material." Recognizing this, he set to work to elucidate the subject by the methods of Koch, but encountered his first difficulty in the fact that, owing to the extraordinary rapidity with which diphtheritic exudation takes place, the organism present in the epithelium at the outset of an attack "may easily be absent at a later stage," as also that local applications may quickly remove it. Twenty-seven cases in all were investigated by him, and they fall into two classes, according to the organism present in the largest numbers. In the first class chain-forming micrococci play a prominent part. (*Vide Oertel.*) It is noted in this connection that "chain-forming micrococci, morphologically identical with those found in Diphtheria, are present in various other diseases which are accom-

panied by lesions of the mucous membrane *e.g.*, variola, typhoid and puerperal fever, etc." Presumably accidentally present in these it may be fairly supposed that they are likewise accidentally present in Diphtheria. "In the second class of cases the bacilli first described by Klebs, are present. These bacilli occur exclusively in those typical cases which are characterized by a thick false membrane extending over the mucous membrane of the fauces, larynx, and trachea, the mucous membrane being traversed by enormously dilated and over-filled vessels. Below the masses of bacteria of different kinds which cover the surface, amongst which may be the streptococcus before referred to, Klebs' bacilli are found arranged in little groups. They became intensely stained with methylene blue. In one case almost the whole false membrane consisted of colonies of this peculiar bacterium."

By cultivations in nutritive jelly, Loëffler obtained from materials taken from internal organs, in five cases, the chain-forming micrococcus; but the result of a large number of inoculations on mice, dogs, rabbits, guinea pigs, birds, and monkeys, shows that the micrococcus must be only accidentally present. He further found that the effects produced by it were the same as those produced by Fehleisen's erysipelas micrococci.

The following results were obtained from the cultivation of the bacilli on blood serum: By successive cultivations he isolated the bacilli and obtained pure colonies of them on the serum. In four typical cases, membrane was taken from the throat with forceps, frozen and sections made. All four sections showed the bacilli after staining. "On the surface were numerous micrococci and below that in the part of the membrane rich in cells were groups of bacilli, and then followed the broad fibrinous zone containing few cells and no bacteria. It was from the deeper part that the material was taken for cultivation in all the cases, and that identical organisms were obtained from all the patients was proved, both by their morphological and biological characteristics" * * * The diphtheritic bacilli are non-motile, and are very quickly and deeply stained with methylene blue; some of them are straight, and some slightly curved. They vary considerably in length, being on an average about the length of the tubercle bacillus, but they are twice as thick. The longer ones are commonly composed of several members, and where these are connected there is frequently a slight, knotty enlargement." They do not produce spores and are destroyed by exposure for half an hour to 60° C. (= 140° F). Their length of life seems to be about three months. They require for development a temperature above 68° F. Inoculation experiments gave a number of interesting results. By subcutaneous inoculation the following results were obtained: "Rats and mice enjoy complete immunity, while guinea-pigs fall easy victims; their death appears to be due, not to the spreading of the bacillus throughout the body, but to a poison produced at the seat of inflammation, which causes an alteration in the walls of the blood-vessels leading to hemorrhages throughout the body. Small birds, canaries, finches, etc., become infected as certainly as guinea-pigs, but more rapidly. Rabbits and monkeys show localized effects of septicaemia but do not develop true diphtheria. In the guinea-pigs infection through the uninjured mucous membrane was proved to be possible—not, however, in other animals."

"While from the experiments it is impossible to say positively that these are the microbes of Diphtheria, the following facts are evidence in favour of their specific character:—They have been found in a large number (13) of typical cases of Diphtheria, with fibrinous exudation on the fauces and in a constantly recurring arrangement; they lie in the oldest part of the membrane, and penetrate deeper than any other bacteria: Cultivations of these organisms introduced beneath the skin of guinea-pigs and small birds kill them, producing whitish or hemorrhagic exudations at the point of inoculation, and extensive oedema of the subcutaneous tissues, the internal organs are not affected, as is the case with man; introduced through a wound of the trachea in rabbits, fowls and pigeons, the poison produces a false membrane, and also if placed on the scarified connective tissue of rabbits, and on the entrance of the dilated vagina of guinea-pigs; in addition to the formation of false membrane, there has been observed the characteristic, serious alteration of the vascular walls, which shows itself by bloody oedema, hemorrhage into the tissue of the lymphatic glands, and effusion into the pleural cavity. The bacilli have therefore the same effect as the diphtheritic virus. They also have the property,

in common with that virus, that they kill young animals generally more easily and quickly than old ones."

Such, then, is an account of the most recent complete experiments I am acquainted with made with the endeavour to isolate the micro-organism which is supposed to cause Diphtheria. From them it would seem almost a certainty that the true *causa morbi* has been isolated; but whether this organism is that which is alone capable of developing the disease, is still fairly a matter of question. The fact that there are several micro-organisms found present in putrefactive animal substances, having, as stated by Klein, the property of multiplying in human blood, thereby setting up a true septicæmia, as well as such experiments as those of L. C. Wooldridge, M.B., with the bacillus producing a fatal septicæmia in guinea-pigs, etc., by which it has been shown that the soluble chemical products of such a bacillus when cultivated in albumen, act as rapid poisons, paralyzing the nerves of respiration, leave still much room for further investigations into the subject. The numerous instances of undoubted cases of Diphtheria occurring *sporadically*, incline us very much to the belief of a possible exciting cause originating in the manner toward which the experiments of Dr. Klein point; although Loeffler's experiments give much force to the remark of Hirsch, that, "from the point of view which the science of the moment assumes in looking at the nature of the specific cause of diphtheria, the theory of its *autochthonous* origin would certainly seem to be untenable—unless we are to give up the principle of *omne vivum ex vivo* in so far as concerns the world of living things which are placed at the lowest step of the developmental ladder."

4. *Exciting Causes of Diphtheria*.—Although for the development of our subject it has seemed proper to devote a considerable space to the history and immediate cause of Diphtheria, that which we are now to consider must undoubtedly be of the first interest to the sanitarian. From all that has been said in the discussion of the *immediate* cause of the disease, it will at once be evident that the presence of organic matter, either vegetable or animal, is—apart from those cases where infection is immediate, *i. e.*, from person to person, as by inhaling the breath—of the greatest possible importance. It must not be forgotten in making this statement that its accuracy has, especially in accounts of epidemics in earlier periods of the present century, been by many authorities strenuously opposed; but, apart from the fact that till within the last twenty years biology can be said to have scarcely had a scientific existence, it only requires one to have some experience of cases of Diphtheria, or indeed of any contagious disease, to understand how extremely difficult it is, and how seldom any thorough investigation of the possible factors conditioning the disease is made. The paramount influence of *unsanitary conditions* upon the occurrence and epidemic diffusion of the disease, as now held by many English, German, French and American physicians is, as stated by Hirsch, well summed up by Dr. Ernest Hart.

"Zymotic disease is mostly bred by poverty out of uncleanness, and diphtheria follows a general law of what may be called the phylogenesis of zymotic poisons in this respect. It takes up its abode by preference in the hovels of the poor, where the stagnant and pent-up air reeks with animal effluvia—where human beings and domestic animals 'pig' together; above all—and this is the centre toward which all sanitary precautions should ever tend—where the poisonous cesspool and the unflushed privy-pit taint the air with subtle effluvia, that seize their victims by the throat and bring death within their foul touch. The extreme tendency to limited action, which marks these epidemics, and which was fully illustrated in the French epidemics, as it has been also in the English, indicates the presence of domestic predisposing causes, amongst which we rank these obnoxious nuisances as of prime activity." Nothing in a general way can be more true than this statement, but it does not by any means state the whole truth; for, as we have already seen, the disease is much more prevalent from year to year in the United States and Canada, amongst a population better housed, better fed, and presumably better prepared, as a whole, to resist the attacks of disease than are the majority of the inhabitants of Great Britain. Where, then, are we to find the explanation, if Dr.

Hart's statements be correct? Is it in our climate, is it in the extreme changes of our seasons? It hardly can be said to be either, since its geographical history shows it to be at times pandemic, and to exist as virulent epidemics in hot climates and in Canada in the hot summer months; while further, as the following table shows, other acute diseases of the respiratory organs are much less prevalent in America than in England.

Deaths from Consumption and Pneumonia in certain Cities for the year ending 1885.

CITIES.	Population.	Consumption. Total Deaths.	Death Rate per 1,000 of Population.	Pneumonia. Total Deaths.	Death Rate per 1,000 of Population.
Brooklyn.....	665,602	1,965	2.95	1,446	2.18
Baltimore.....	417,220	*1,270	3.04	581	1.39
Chicago.....	664,634	1,162	1.74	736	1.10
Glasgow (includes other acute pulmonary diseases).....	534,624	1,562	2.9	3,103	5.8

**The unusually high death-rate of Consumption in Baltimore occurs amongst the negro population.*

While the teachings of this Table have a most important bearing on the point we are discussing, I think, however, that the fact that the ordinary contagious diseases are probably less prevalent in America than in Britain, must cause us to recognize that climate and especially certain seasons have some definite influence on the prevalence of Diphtheria.

But remembering the fact that, in spite of the high death-rate of young children amongst the poorer classes, as also of the very large proportion of lung diseases in England and Wales, the death-rate there has been reduced to less than 20 in the 1,000 of population, we have no alternative but to conclude that the explanation of the relative immunity of that country from Diphtheria lies (1) in the more complete organization of local sanitary authorities, as seen in the matter of notification of disease, and (2) in the much more thorough systems of town sewerage and house construction which there exist. The following extract has in the highest degree importance for us; I quote from the preface of the report on "The Main Drainage of the Houses of Parliament, Westminster, London, 1887," by Isaac Shone, C. E., an extract from Professor Huxley's address before the Society of Arts, 1881:—"Disagreeable and imperfect as the old cesspool system was, it was attended with very little danger as compared with that which waits upon the modern water sewage system, if this system is imperfect. If it is perfect, then it is very perfect; and, in fact, it is the only possible system in great cities in the present day. It has, however, this terrible peculiarity, that if it is imperfect, it becomes the most admirable machinery for distributing the death and disease which may be found in one locality as widely as possible into others, and into the very houses of the people."

Referring to sewered towns in the United States, unless it be a few of the largest, I take it as unnecessary of proof that they are similar to Canadian towns and cities, and speaking from a considerable knowledge of these, I would say that Tyndall's remarks are too terribly true. Take Toronto, as an example. During last year, some 2,500 houses were erected, the great proportion being on sewered streets, and, from what I know, every owner or architect was a law unto himself. Assuming 2,000 houses to have been connected with sewers, we have as many canals by which sewer air may possibly be conveyed to a population approaching 10,000 individuals. Assuming further that the other houses, some 18,000, containing 90,000 more persons, are connected with sewers, we have a total of 20,000 houses holding possible communication with the terrible unknown. If we admit that five houses in every hundred have sewer gas entering them through drain and soil pipes, laid by *any* person, laid ignorantly and cheaply, knowingly and wickedly, inspected by nobody, or by

nobodies inspected, we would then have 1,000 houses, and 5,000 men, women and children in them, day in and day out, breathing the products of decomposition; inhaling death sometimes slowly, at others as with our children, with the swiftness almost of a thunder-bolt; and still we wonder how it is that nearly 2 children in every 1,000 of this 100,000, or 1 in every 25 of these 5,000 men, women and children die of Diphtheria.

Referring, further, to the conditions of our provincial towns and cities, we have, in addition to those just mentioned, the facts that except in a few no systems of sewers exist; while the public drains, when existing, often connect directly by old and decaying wooden drains, wholly untrapped, with kitchen sinks and cellars; and further, in these places well-water is in common use, and pumped from a soil yearly becoming more polluted with organic matter from yards, stables and privies. That common experience in Ontario connects Diphtheria with such cases, may be illustrated by the fact that in answers received from 138 reporters—wherein 1,149 cases and 328 deaths were stated to have occurred within nine months in 1886, the exciting causes given are:—"Impure water; wells too near privies; vitiated air from, damp, ill-ventilated cellars and filthy surroundings; houses built on or too near the ground, thus shutting out air from the foundations; cellars without any drains, or if present, improperly constructed and trapped; and, finally, poverty, uncleanness of the person, and exposure to the inclemency of the weather."

In the report of an investigation made personally into an epidemic of Diphtheria in Smith's Falls three years ago, where 36 sets of cases occurred in as many houses, including 91 cases in all and 24 deaths, or 26 per cent., I find the following:—"Making every allowance for imperfect sources of information, for wrong information and mistaken inferences, the facts detailed in the appended tables seem to give ample proof of (1) the contagiousness of the disease, (2) of how its severity is intensified by bad sanitary surroundings and (3) of how in some cases, apparently, the disease originates in unsanitary conditions apart from direct contagion." In the instance of the family wherein the first case occurred it is stated that "the condition of the premises is significantly suggestive of Diphtheria. It is described "not good, a number of tenants have privies on the same lot; they are very close and a butcher shop is next door, the water is got from a public pump." Again, "it may be mentioned in connection with the town hall cases, that a cistern was in part under the rooms into which the caretaker's family was crowded. The night in which the first child died was that on which a dancing assembly was present in the hall above. Very shortly afterwards one, and probably two, of the young ladies attending the ball contracted the disease." As an interesting example of infectiousness I quote the following:—"Another centre from which apparently the disease spread was Percy's tailor-store and shop. The family lived over the store. The disease broke out here. The father went back and forth from rooms to shop where sewing-girls worked and to which customers came. One of the Brennans, in whose house occurred six cases and two deaths, worked in the shop and apparently conveyed the disease home."

That the unsanitary factor is a potent one from all that has been said, must be evident to every one, and that it has hitherto seldom been dissociated from the other equally potent fact of infection, is just as plain. From the following table, extracted from the annual report for 1886, of Dr. Carson, Medical Health Officer of St. Louis, we may fairly draw the conclusion that the latter (*i.e.*, immediate infection) is the more common way by which the disease is disseminated:—

Percentage of Death-rate from Diphtheria in each of the Twenty-eight Districts of St. Louis to the total deaths from all causes in each District.

DISTRICTS.	Total Deaths from all Causes.	Total Deaths from Diphtheria.	Percentage of Deaths from Diphtheria to Total Deaths.
District No. I	289	12	4.15
do II	177	10	5.64
do III	269	24	8.92
do IV	632	32	5.06
do V	421	59	14.01
do VI	135	26	19.99
do VII	271	35	12.91
do VIII	150	11	7.33
do IX	307	55	17.91
do X	505	21	4.15
do XI	191	45	23.56
do XII	564	40	7.09
do XIII	177	24	13.55
do XIV	392	55	14.03
do XV	692	13	1.87
do XVI	360	54	15.00
do XVII	278	11	3.95
do XVIII	412	18	4.36
do XIX	230	16	6.95
do XX	324	18	5.55
do XXI	173	26	15.02
do XXII	112	12	10.71
do XXIII	157	7	4.45
do XXIV	267	51	19.10
do XXV	14	3	21.42
do XXVI	69	7	10.14
do XXVII	418	13	3.11
do XXVIII	252	21	8.33
Totals	8238	719	10.29

We here see that there is no very marked connection between contiguous districts of the city as regards prevalence of the disease, the disease being, on the whole, proportionately to the totality of deaths, quite as prevalent in the new as in the older districts. Whether this is true as regard the deaths in relation to population, I have not the data necessary for the calculation. The fact, however, that contiguous wards show no specially close relations, appears to me to prove that isolation of the disease has been very imperfect; for it would seem as if the disease once introduced in a ward would light up sometimes into a flame, while at others, as is the case with sporadic cases of many contagious cases, the first is isolated and no second occur.

Closely related with these conditions favouring the propagation of the disease, is the question of the influence of cold upon its prevalence. In the extended tables already given we will have noticed that there is evidence of a general decline of the disease in warmer weather. At first sight this fact seems opposed to the putrefaction theory of the disease; but the real circumstances of the case are so well set forth in the following extract from Hirsch, that little further need be said on the point:—"We should bear in mind . . . that the prevalence of the disease mostly goes with the cold seasons of the year; and that is a circumstance which on the one hand sets the putrefaction theory in a still more ambiguous light, while on the other hand it raises the question whether it is not the changed mode of life following the cold weather, and most of all the artificial heating and keeping warm of rooms, the bad ventilation and the saturation of the atmosphere with watery vapour, in short the production of what Krieger calls 'an artificial climate'—whether it is not all these things acting upon the organism, and particularly upon the organism of the child, that go to make the real predisposing cause of the disease. . . . But there is another, if subordinate, circumstance connected with the prevalence of the disease during the cold

months, namely, the great multiplication of the perils of contact, while that season lasts, between the more or less crowded inmates of the heated rooms, and the increased opportunities thereby offered for the transmission of the disease; and that is a circumstance, it is easy to see, which will tell much more among those of the population who are less well off than among those at the opposite pole of well-being, and will serve to explain without difficulty, in my opinion, the fact so often observed of diphtheria being prevalent among the proletariat."

Regarding the meteorological conditions which tend to increased prevalence of the disease it may, in a word, be stated that while undoubtedly there are certain periods when there seems to exist a special tendency for *sore throat* to take on a diphtheritic form, yet it must be admitted that no sufficiently extended experiments regarding the influence of *ozone*, as an irritant of the mucous membrane, have been made from which it can definitely be inferred that it is an unvarying element in the question of exciting causes. In connection with meteorological conditions, the further question of soil dampness in its influence in the causation of the disease is worthy of being discussed here at some length. As, however, the conditions under which moisture influences the development of bacteria were fully discussed in my report on "Malaria in the Valley of the Grand River," printed in the Report of 1884, as were also the physical conditions which cause the varied distribution of bacteria from the soil, etc., into the atmosphere, I would refer those further interested in the subject to peruse that article.

5. *Measures for Limiting the Spread of the Disease.*—From what has been said regarding the characteristics of the disease as being those of a true zymotic, of the nature of the cause as being due, according to the best evidence, to bacteria, and of the conditions apparently favoring the development and dissemination of the disease, it will not be difficult to see that the question of limiting its spread is the same in large measure as that for contagious diseases in general. Such may especially be said as regards limiting the spread of the disease from person to person where it already exists: but since Diphtheria, as well as typhoid, seems to have certain special relations with the putrefaction of albumenoid matters, not common to the eruptive zymotics, it would appear that in a very special sense we have to deal with the question of how best to prevent individuals, but especially children, from being exposed to the malign influences of organic filth.

In a recent edition of the pamphlet, on "Rules for Checking the Spread of Contagious or Infectious Diseases," issued by the Board, these details have been dealt with very fully from both the individual and municipal standpoint. Without entering into the minute detail of the pamphlet, I shall, however, before referring to some of the reasons why preventive measures are taken, and to some of the more obscure phases of the life-history of the micro-organisms of these diseases, give the

REGULATIONS DRAFTED BY THE PROVINCIAL BOARD OF HEALTH *re* DIPHTHERIA.

(Submitted for Approval.)

Whereas it is desirable to prevent Diphtheria from becoming epidemic in Ontario,—therefore the Provincial Board of Health, subject to the approval of the Lieutenant-Governor in Council, enacts the following regulations:—

1. Whenever Diphtheria is present in any municipality in Ontario, the council of every such municipality shall at once appoint one or more sanitary policemen for the purpose of assisting to arrest the spread of the disease, and the Council of any municipality in Ontario where the Provincial Board of Health deems the appointment of one or more sanitary policemen necessary shall also make such appointment. If the Medical Health Officer of the municipality, or the Provincial Board of Health, require the appointment of any specified number of sanitary policemen, then such number shall be appointed. In case the council of a municipality neglects or refuses to make the required appointments, the Provincial Board of Health may appoint as many sanitary policemen for such municipality as it deems necessary.

2. Any default on the part of the authorities of any municipality in taking immediate and effective action in carrying out the regulations of the Provincial Board of Health, or of any of the Health Acts of this Province, or of any Health By-law in force in the municipality, shall be at once reported by the Medical Health Officer to the Secretary of the Provincial Board, in order that the said Board may take such measures as it deems requisite for placing the said municipality in a position, as regards its sanitary arrangements, to effectively combat the said disease.

3. The Medical Health Officer of every municipality having received information of a suspected case of Diphtheria, shall immediately enquire into the facts either by consultation with the attending physician or by his own personal observation, or by both.

If the characteristic symptoms are not sufficiently developed at the time of investigation, the Medical Health Officer shall keep the case under his personal observation until the true nature of the disease is discovered.

Until the time arrives when, in the opinion of the Medical Officer, all cause for suspicion or danger is past, the suspected case shall be isolated and otherwise dealt with in the same manner as prescribed for Diphtheria.

4. On the occurrence of the first, or any, case of Diphtheria in a municipality, the Medical Health Officer shall at once remove the person attacked to the isolation hospital, tent, or other place provided under section 44 of the Public Health Act, 1884, or cause such person to be otherwise efficiently isolated in the house where the disease exists and shall take proper measures for placarding houses for the disinfection of personal clothing and houses, or if necessary the destruction of all clothing which may have been exposed to the contagion, and for the disinfection and purification of every conveyance, rail-car, steamboat, sailing-vessel, carriage, or other vehicle, which may have been exposed to the contagion.

5. Whenever, in the opinion of the Medical Health Officer, it is absolutely necessary for the safety of the public that a case of Diphtheria be isolated in a hospital or hospital tent, he shall be empowered to supply, at the expense of the municipality, a vehicle for the purpose of carrying said person to the hospital. He shall also supply nurses and such medical aid and other necessities as in his judgment are required, and charge the cost of same to such person or persons as are liable for his support, if able to pay the same, otherwise to the municipality.

6. He shall further keep under observation all persons who have been exposed to contagion, and shall secure the rigid observance of the following regulations, in addition to the provisions of the Public Health Acts and all other sanitary regulations and enactments:—

(Vide Public Health Act, 1884, Sections 46, 49, 52, 53, 60 and 62; also Public Health Acts of 1885 and 1886.)

(1) No householder in whose dwelling there occurs a case of Diphtheria, shall permit any person suffering from the disease, or any clothing or other property, to be removed from his house, without the consent of the Medical Health Officer.

(2) No person sick with Diphtheria shall be removed at any time, except by permission and under direction of the Medical Health Officer; nor shall any occupant of any house in which this disease exists, change his or her residence to any other place without the consent of the Medical Health Officer, who shall prescribe conditions as set forth in pamphlet No. 15 issued by the Provincial Board of Health, entitled "Rules for Checking the Spread of Contagious or Infectious Diseases."

(3) Except the attending physician or clergyman, no person affected with Diphtheria, and no person having access to any person affected with the said disease, shall mingle with the general public until such sanitary precautions as are set forth in pamphlet No. 15, issued by the Provincial Board of Health, to the satisfaction of the Medical Health Officer as attested by his certificate, shall have been complied with; nor shall any such person expose him or herself in any public place, shop, street, inn or public conveyance, without having first adopted such precautions.

(4) All persons named in the last preceding clause are hereby required to adopt for the disinfection of utensils, bedding, clothing and other things which have been exposed to infection, such measures as are set forth in pamphlet No. 15, issued by the Provincial Board of Health; and they are further required to satisfy the Medical Health Officer that such measures have been properly carried out.

(5) No person suffering from, or having very recently recovered from Diphtheria, shall expose himself, nor shall any person expose anyone under his charge who is so suffering, or who has recently recovered from this disease, in any conveyance without having previously notified the owner or person in charge of such conveyance of the fact of his having, or having recently had, such disease.

(6) The owner or person in charge of any such conveyance must not, after the entry of any so infected person into his conveyance, allow any other person to enter it without having sufficiently disinfected it under the direction of the Medical Health Officer.

(7) No person shall give, lend, transmit, sell or expose any bedding, clothing or other article likely to convey Diphtheria without having first taken such precautions as are set forth in pamphlet No. 15, issued by the Provincial Board of Health above cited, for removing all danger of communicating the disease to others.

(8) No person shall let or hire any house or room in a house in which Diphtheria has recently existed, without having caused the house and premises used in connection therewith to be disinfected to the satisfaction of the Medical Health Officer; and for the purposes of this section the keeper of an inn or house for the reception of lodgers shall be deemed to let for hire part of a house, to any person admitted as a guest into such inn or house.

7. In case of the death of any person suffering from Diphtheria, the Medical Health Officer shall at once upon notification of such death superintend the preparation of the body for interment; he shall cause it to be enveloped in a sheet thoroughly saturated with a solution of mercuric chloride in the proportion of one in five hundred parts (two drachms to the gallon). An outer sheet shall also be applied to prevent evaporation.

As soon as possible the body shall be placed in a coffin and surrounded by a quantity of chloride of lime, and the coffin shall be immediately thereafter closed. It shall be the further duty of the Medical Health Officer to see that the funeral be strictly private, and that all infected apartments, clothing and other effects be speedily and thoroughly disinfected; and that no such apartments be entered or occupied by members of the family or other persons until they shall have been so disinfected.

8. Penalties for the violation of any of the above regulations are those contained in Sec. 65, Public Health Act, 1884; and Sub-section 2 of Sec. 15, Public Health Act, 1885.

Assuming that the specific microbes of Diphtheria are *bacilli*, we naturally ask ourselves, what are their habits, where do they principally abound, what conditions aid or retard their development, what is their vitality, what destroys them, etc.? In order to answer these and many other questions we may put to ourselves, we have to discuss, as far as we know it, the life-history of bacilli in general. These micro-organisms are cryptogamic plants, multiplying both by gemmation and by formation of spores. Some bacilli,

amongst which Loeffler places Klebs' *bacillus diphtheriae*, do not form spores. On this quality depends apparently the question of the vitality of any bacillus, since not only do non-sporing bacilli die much sooner than the spores of other bacilli, but the bacillus itself without spores is destroyed usually by a temperature of 60 C. (= 140° F.) maintained for a few minutes; while the spores, when not developing—as they do when kept warm and moist—require for their destruction a temperature of 103° C. (= 218° F.), maintained for some time. Should it be proved by further experiments that Diphtheria is caused by bacilli, which sometimes do form spores, their vitality and the conditions under which they are destroyed will then be better appreciated. Assuming in the next place, that these micro-organisms, like most other bacilli, grow in materials other than the blood of man and certain animals, we can understand that the filth of rooms, of polluted soil, impure water, etc., will most probably keep them alive; in other words act as more or less perfect culture media, according to surrounding conditions. On no other ground, unless we admit that there is more than one species which causes Diphtheria, or that *bacillus diphtheriae* has a life lasting much longer than that ascribed to it by Loeffler, viz. : about three months, can we account for isolated outbreaks, as in farm-houses, or for the occurrence of the disease in the same house at periods separated by many months. Should this supposition be true, then we ask where and in what materials do bacilli most abound? Every investigator, Duclaux, Koch, etc., assures us, that ordinary air contains very few microbes as compared with garden mold and moist waters. These again vary greatly in the numbers they contain. Thus Miquel, by long-continued experiment, assures us that country air is much freer than city air; that the air of hospitals, houses, etc., contains infinitely more than even the open air of cities; that after winds the atmosphere contains very many more, and then after rain or snow it contains very many less than at other times; that there are many more in summer and autumn than in winter and spring. Koch informs us further that the relative numbers of bacteria, and of bacteria to fungi, vary according to the locality of confined air, and points out that both were very abundant in the air near the cages of his experimental animals; he found, too, that even winter outside air contains very many active spores. The upper layers of soil are especially rich in the spores of bacilli (Koch, Miquel, etc.); and Koch remarks that bacilli are always especially present in large number in the superficial soil around dwelling-houses. These, owing to their forming spores, are not readily killed by the drying out of the earth, etc. If in air and soil, they will very naturally be abundantly present in water, which is contaminated by both. Remembering, then, that spores have an almost unlimited vitality like many other seeds, when under conditions unfavourable to their development, and that their growth means simply that of the bacillus itself, we very naturally enquire, what seems at one time to aid and at another to retard their growth?

This, as regards zymotic diseases, has ever been a question of great difficulty, which so far, has been very imperfectly answered; but we may conclude that their free development depends:—

(1) Primarily upon abundance of seeds, of which the converse is of course equally true.

(2) Sufficient nutriment and of the proper kind.

(3) A proper temperature and sufficient moisture.

(4) No opposing influences.

Let us now discuss some of the apparently opposing influences. All our prominent investigators are seeking to determine these by unceasing experimentation, and amongst these influences the following have been, more or less well demonstrated.

1. Pasteur found that the virus contained in a culture fluid decreased in virulence, in other words, became attenuated through lapse of time; spores resist, however, the influence of time.

2. By later experiment he found that it was the presence of the oxygen of the air, in contact with a culture whose constituents had become exhausted, that caused the attenuation.

3. He further determined that spore-producing *bacilli*, do not spore or seed until a certain temperature of the culture fluid 45° C. (113° F.) is passed.

4. Virus, attenuated by exposure to oxygen for varying lengths of time, or as further proved, in cultures of varying degrees of richness, can be maintained in this state by further cultures repeated in the same manner, or by passing it through animals of differing susceptibilities; similarly by changing the culture medium, (a solution, or the body of an animal), the original virulence can gradually be restored. (Such a virus kept for a long time at the temperature of an ordinary room, gradually loses its virulence. *Vide* Pasteur, Koch).

5. Spores may be developed from *bacilli* of different degrees of virulence, and these retain "the degree of virulence peculiar to the bacterium from which it emanates."

6. The method by which a virus is introduced into the body greatly alters its effects. Koch has shown that *bacillus anthracis* introduced into the stomach of sheep, produced no effects, but that bacilli with spores similarly introduced caused death. He concludes that the natural digestive juices of the stomach destroy the bacillus. (This aids to explain the facts of anthrax and foot-and-mouth disease, being readily contracted from pastures, as soil contains especially the spores, and such bacilli as may be in it; *vide* Pasteur *re* spread of anthrax, by earth-worms).

7. It has by various investigators, been shown that the attenuation of a virus may be readily accomplished by its cultivation in a culture, to which antiseptics have been added (*vide* Chamberland and Roux *re* carbolic acid solutions, Klein *re* mercuric bichloride solutions, phenylacetic acid, phenylpropionic acid, etc.)

9. An interesting fact, allied to this, is pointed out by Dr. Cash in certain experiments, viz.: that by the injection of mercuric bichloride into animals, before inoculation with *bacillus anthracis*, etc., the disease is modified greatly, being much milder.

10. In a series of interesting experiments by Klein, it has been shown that bacteria introduced into a culture, become inactive, and sink to the bottom of the fluid, not from want of nutriment, but in consequence of the production in their development of substances poisonous to themselves, such as phenylacetic and phenylpropionic acids. In other words a specific bacterium in a given culture is self-limiting. It may not be so however, to every other, as—

11. It is well established by experiment on beer-wort, etc., that one bacterium, after another, as the fluid undergoes changes, will take possession of it as the *yeast* plant, *mycoderma aceti*, *mycoderma vini*, *penicillium glaucum* (lactic acid ferment) in deeper parts of the solution, utilizing the oxygen of the organic compounds.

12. Intimately associated with this are the facts that the growth of bacteria causes a loss of the contained oxygen of a solution, and that bacteria developed in cultures *in vacuo* become inactive. (*Vide* J. P. Laws, F. C. S.)

13. A fact of equally great interest is that which has by experiment been discovered by Dr. Dupré, by which he shows that periodical differences are shown by waters from the same source in their capacity for absorbing oxygen, and similarly finds that bacteria exhibit differences in the relative consumption of oxygen, necessary for their development.

14. But one more point need be added in this connection and it is, that, while excess of oxygen has not been shown to be inimical to bacteria, except by aiding their excessive development, thereby sooner exhausting nutriment, still ozone in a most marked manner, prevents the free development of bacteria, but especially those of the putrefactive processes as *micrococci*.

While many more points might be selected, showing on what basis, prophylactic measures are taken for preventing by vaccination diseases, as small-pox, anthrax, etc., and for limiting the spread of diseases by germicides, as mercuric bichloride, still the reasonableness of cleanliness, by destruction of any organic refuse, thereby lessening bacterial *pabulum*, of the necessity for the never ceasing ventilation of sick rooms and infected dwellings by the oxygen of fresh air oxidizing organic matter and attenuating the virus, as well as the *raison d'être*, of other ordinary sanitary measures, are so well illustrated by all this experimental evidence, that it will be apparent that as we enlarge the boundary of exact knowledge regarding the life history of the limitless number of species of micro-organisms, we will relatively extend our power to deal practically both through medicine and sanitation, with the limitation of those of a pathogenic nature inimical to man and the useful domestic animals.

TABLES APPENDED TO REPORT IN DIPHTHERIA.

TABLE I.

Showing Total Deaths from Diphtheria and Croup in 1884 in several principal Towns and Cities in each of the District Divisions of England and Wales.

DISTRICT.	NAME.	POPULATION.	DIPHTHERIA AND CROUP.	DEATHS PER 1000 OF POPULATION.
No. I.	London.....	4,019,361	2,037	.49
SOUTH- EASTERN DISTRICT.	Surrey. { Croydon Kingston Guilford }	247,858	116	.46
	Kent. { Medway Dartford Tunbridge }	173,249	197	1.13
	Sussex. { Hastings Brighton Steyning }	206,241	72	.34
	Hamp- shire. { Portsea Island Isle of Wight Southampton }	264,828	123	.46
	Berk- shire. { Reading Windsor Newbury }	100,685	62	.61
	Total.....	992,861		Average .60

TABLE I.—*Continued.*

DISTRICT.	NAME.	POPULATION.	DIPHTHERIA AND CROUP.	DEATHS PER 1000 OF POPULATION.
No. III. SOUTH MIDLAND DISTRICT.	Middle- sex. { Brentford Edmonton Hendon }	307,298	277	.90
	Hert- ford. { St. Albans Hitchin Watford }	85,321	47	.55
	Buck- ham. { Eton Aylesbury Buckingham }	67,334	21	.81
	Oxford. { Henley Woodstock Banbury }	65,968	13	.19
	North- ampton. { Northampton Wellingborough Peterborough }	148,364	54	.36
	Hunting- donshire. { Huntingdon St. Ives St. Neots }	55,351	19	.34
	Bedford- shire. { Bedford Amphill Luton }	102,629	80	.75
	Cambridge- shire. { Cambridge Newmarket Wisbech }	99,912	72	.72
	Total	932,177		Average .52
No. IV. EASTERN DISTRICT.	Essex. { West Ham Chelmsford Braintree }	273,057	161	.58
	Suffolk. { Sudbury Ipswich Mutford }	114,749	25	.21
	Norfolk. { Norwich Mutford Walsingham }	140,556	98	.69
	Total	528,362		Average .49

TABLE I.—*Continued.*

DISTRICT.	NAME.	POPULATION.	DIPHTHERIA OR CROUP.	DEATHS PER 1000 OF POPULATION.
No. V. SOUTH WESTERN DISTRICT.	Wiltshire. { Chippenham Devizes Warminster	57,709	43	.74
	Dorset- shire. { Poole Weymouth Bridport			
	Devon- shire. { Newton Abbot Plymouth Barnstaple	194,545	36	.18
	Cornwall. { St. Anstell Penzance Redruth			
	Somerset- shire. { Bath Bedminster Exbridge	186,663	22	.11
	Total	639,801		Average .28
No. VI. WEST MIDLAND DISTRICT.	Gloucester- shire. { Cheltenham Gloucester Barton Regis	279,241	56	.20
	Hereford- shire. { Hereford Don Ross Yeominster			
	Shrop- shire. { Wellington Bridgenorth Ludlow	62,764	20	.31
	Stafford- shire. { Stoke-upon-Trent Wolverhampton West Bromwich			
	Worcester- shire. { Stourbridge Kings Norton Kidderminster	216,679	39	.18
	Warwick. { Birmingham Aston .. Coventry			
	Total	1,529,729		Average .22

TABLE I.—*Continued.*

DISTRICT.	NAME.	POPULATION.	DIPHTHERIA OR CROUP.	DEATHS PER 1000 OF POPULATION.
No. VII. NORTH MIDLAND DISTRICT.	Leicester-shire. { Leicester	181,763	47	.25
	Ashby			
	Barrow			
	Rutland-shire. { Uppingham	53,505	12	.22
	Boston			
	Lincoln-shire. { Lincoln	136,573	44	.32
	Caistor			
	Nottingham-shire. { Bassford	319,091	202	.63
	Nottingham			
	Newark			
	Derby-shire. { Derby	216,206	20	.09
	Chesterfield			
	Blakewell			
	Total	907,138		Average .30
No. VIII. NORTH- WESTERN DISTRICT.	Cheshire. { Stockport	293,413	81	.27
	Nantwich			
	Birkenhead			
	Lancashire. { Liverpool	719,001	308	.42
	West Derby			
	Rochdale			
	Total	1,012,414		Average .35
No. IX. YORKSHIRE DISTRICT.	West Riding. { Huddersfield	530,488	78	.14
	Halifax			
	Sheffield			
	East Riding. { York	181,980	48	.26
	Hull			
	Duffield			
	North Riding. { Scarborough	156,334	24	.15
	Middlesborough			
	Whitby			
	Total	868,802		Average .27

TABLE I.—*Continued.*

DISTRICT.	NAME.	POPULATION.	DIPHThERIA OR CROUP.	DEATHS PER 1000 OF POPULATION.
No. X. NORTHERN DISTRICT.	Durham. { Sunderland South Shields Gateshead }	361,809	108	.29
	North-umberland. { Newcastle-on-Tyne Tynemouth Morpeth }	312,546	73	.23
	Cumber-land. { Carlisle Cockermouth Whitehaven }	175,595	39	.22
	West-moreland. { Kendall East Ward West Ward }	66,886	10	.15
	Total.....	916,836		Average .22
No. XI. MONMOUTH- SHIRE AND WALES DISTRICT.	Mon-mouth. { Monmouth Bidwelty Newport }	162,990	31	.19
	South Wales. { Cardiff Merthyr Tydfil Swansea }	314,710	124	.39
	North Wales. { Wrexham Carnarvon Bangor }	143,171	52	.36
	Total.....	620,871		Average .31
	Grand total of XI. Districts....	12,968,352		4.06 or ave- rage of .40
	Diphtheria and Croup.....		5,248	

Population of England, 1884..... 27,132,449
Diphtheria and Croup, “ 10,768

TABLE II.

Mortuary Statistics of Diphtheria in Fifty Cities of the United States, for the year ending June 1, 1880, included in the XXI. Grand Groups.

(Selected from the Census Report, 1880.)

	CITIES.	Population of each.	Total Population.	Diphtheria--Total.	Group--Total.	Grand Total.	Deaths per 1,000 of population.
GRAND GROUP No. I.	(Boston, Mass. Cambridge, " Lawrence, " Lowell, " Fall River, " Lynn, " New Haven, Conn. Providence, R. I.	362,339 39,151 52,669 59,675 48,961 38,274 62,882 104,857	768,808	M. 362 F. 379 741	M. 156 F. 143 299	1,040	1.35
GRAND GROUP No. II.	(Baltimore, Md. Brooklyn, N. Y. New York City, N. Y. Camden, N. J. Jersey City, N. C. Newark, N. J. Washington, D. C. Willimington, Ill.	332,313 566,663 1,206,299 41,659 120,722 136,508 147,293 42,478	2,593,935	M. 980 F. 1056 2036	M. 644 F. 564 1208	3,244	1.25
GRAND GROUP No. III.	{ Charleston, S. C.	49,984	49,984	M. 22 F. 9 31	M. 4 F. 2 6	37	.74
GRAND GROUP No. IV.	{ New Orleans, La.	216,090	216,090	M. 31 F. 36 67	M. 23 F. 33 56	123	.56
GRAND GROUP No. V.	{ Hartford, Conn. Worcester, Mass.	42,015 58,291	100,306	M. 17 F. 15 32	M. 14 F. 8 22	54	.53
GRAND GROUP No. VI.	{ Paterson, N. J. Scranton, Pa.	51,031 45,850	96,881	M. 38 F. 25 63	M. 38 F. 30 68	131	1.35
GRAND GROUP No. VII.	(Buffalo, N. Y. Chicago, Ill. Cleveland, O. Detroit, Mich. Milwaukee, Wis. Rochester, N. Y. Toledo, O.	155,134 503,185 160,146 116,340 115,557 89,366 50,137	1,189,865	M. 828 F. 834 1,662	M. 397 F. 307 704	2,366	1.98

TABLE II.—Continued.

	CITIES.	Population of each.	Total Population.	Diphtheria--Total.	Group--Total.	Grand Total.	Deaths per 1000 of populations.
GRAND GROUP No. VIII.	Albany, N. Y. Alleghany City, Pa. Philadelphia, Pa. Pittsburg, " Reading, " Richmond, Va. Syracuse, N. Y. Troy, "	90,758 78,682 847,170 156,389 43,778 63,600 51,792 56,747	1,388,916	M. 455 F. 510 965	M. 258 F. 200 458	1,423	1.02
GRAND GROUP No. IX.	{ There are no large cities in this group.						
GRAND GROUP No. X.	Cincinnati, O. Dayton, O. Louisville, Ky.	255,139 38,678 128,758	417,575	M. 110 F. 115 225	M. 49 F. 41 90	315	.75
GRAND GROUP Nos. XI. & XII.	{ There are no large cities in these groups.						
GRAND GROUP No. XIII.	Minneapolis, Minn. St. Louis, Mo. St. Paul, Minn.	46,887 350,158 41,473	438,518	M. 99 F. 99 198	M. 32 F. 44 76	274	.62
GRAND GROUP No. XIV.	{ There are no large cities in this group.						
GRAND GROUP No. XV.	Columbus, O. Indianapolis, Ind. Nashville, Tenn.	51,647 75,056 43,350	170,053	M. 36 F. 26 62	M. 17 F. 19 36	98	.57
GRAND GROUP No. XVI.	{ No large cities in this group.						
GRAND GROUP No. XVII.	{ Kansas City, Mo.	55,785	55,785	M. 17 F. 8 25	M. 13 F. 9 22	47	.84
GRAND GROUP No. XVIII.	{ Denver City, Col.	35,629	35,629	M. 22 F. 31 53	M. 5 F. 5 10	63	1.76
GRAND GROUP Nos. XIX. & XX.	{ There are no large cities in these groups.						

TABLE II.—*Continued.*

	CITIES.	Population of each.	Total Population.	Diphtheria—Total.	Croup—Total.	Grand Total.	Deaths per 1000 of population.
GRAND GROUP No. XXI.	{ Oakland, Cal.	34,555 }	268,514	M. 40	M. 21	115	.43
	{ San Francisco, Cal.	233,959 }		F. 34	F. 20		
	Total		7,790,859	74	41		13.75
	Diphtheria and Croup		9,330			or aver	age 1.19

TABLE III.

Mortuary Statistics of Diphtheria taken from Reports of State Boards of Health for the following States and Years :—

STATE.	YEAR.	POPULATION.	DEATHS.	RATE PER 1,000 OF POPULATION.	REMARKS.
California	{ 1884, July .. 1885, June.. }	864,694	401	.47	
Connecticut	1884	683,577	504	.74	Returns good.
Indiana	1884	1,978,301	424	.21	Very imperfect.
Iowa	1881	1,624,615	1,174	.72	Actual registration about 50 per cent.
Louisiana	1880	939,946	155	.16	Imperfect returns.
Michigan	From 1878 to 1882	1,636,937	No. of deaths— 1,455. Total deaths— 7,379	4.5 made 1 to U.S. ave. .90 per year, an average.	Tolerably complete.
Michigan	Individual years. 1878 1879 1880 1881 1882	..... ..... ..... ..... .....	887 1,473 1,542 2,063 1,414	}	Note the general increase from year to year.
Massachusetts	{ 1881 1882 1885 }	1,867,444 1,921,719 1,942,141	2,383 1,771 1,523	1.29 .92 .79 }	Registration good.
New Hampshire.....	1884	346,991	159	.46	Registration good.
Rhode Island.....	1884	304,000	199	.65	Registration good.
Total		14,110,365	10,148	.71	

TABLE IV.—Showing Deaths from Diphtheria in 1885 and 1886 in the following Cities of the United States :

BALTIMORE.

(Diphtheria and Croup [membranous].)

YEAR.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Totals.	Population.	Cases to 1,000 of population.	Deaths to 1,000 of population.
1885 Deaths..	31	17	7	13	11	6	6	24	38	45	28	26	D. 252 C. 148	417,220	.....	.60 1.35
1886 Deaths..	27	10	11	11	10	10	8	7	17	32	30	17	190	.....	.....	.45

BROOKLYN.

(Diphtheria and Croup [membranous].)

	FIRST QUARTER.	SECOND QUARTER.	THIRD QUARTER.	FOURTH QUARTER.		
1885 Cases ...	382	291	225	450	1,348	664,602
" Deaths..	136	116	84	183	D. 519 C. 313	.....
						2.02
						.78

ST. LOUIS.

1885 Cases ...	108	92	79	59	64	33	32	81	140	198	204	193	1,283	400,000	3.20	
" Deaths..	29	17	22	17	13	21	10	32	44	55	55	57	372	.....	.....	.93
1886 Cases ...	124	94	82	107	100	123	138	187	292	429	630	460	2,826	400,000	7.06	
" Deaths..	45	35	42	24	28	32	48	57	85	106	123	94	719	.....	.....	1.79

TABLE IV.—Continued.

CHICAGO.

(*Diphtheria and Croup [membranous].*)

YEAR.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Total.	Population.	Cases to 1,000 of population.	Deaths of 1,000 of population.
1885	Cases ...	...	...	...	...	...	...	...	...	...	...	...	D. 706 C. 306	630,000	...	1.12
"	Deaths ..	54	50	62	48	36	31	45	77	81	79	72	...	...	...	.48
1886	Cases ...	...	...	...	...	...	...	...	...	...	...	...	D. 944 C. 429	700,000	...	1.03
"	Deaths ..	78	55	66	70	78	56	74	60	105	139	111	...	...	...	.06

NEW YORK.

1885	Cases ...	275	259	229	292	231	253	229	106	181	185	251	429	2,920	1,397,395	2.09	.94
"	Deaths ..	108	121	121	115	102	115	101	71	87	87	122	175	1,325	...	...	...
1886	Cases ...	325	305	315	260	290	268	322	193	193	294	407	575	3,747	1,439,037	2.60	1.20
"	Deaths ..	155	149	134	124	142	130	133	104	85	165	188	218	1,727	...	...	...

BROOKLYN.—DIPHTHERIA AND CROUP (MEMBRANOUS) FOR TEN YEARS.

	1876.	1877.	1878.	1879.	1880.	1881.	1882.	1883.	1884.	1885.
Diphtheria	812	778	544	689	1,118	1,169	632	409	385	519
Population	498,300	514,300	531,100	548,500	566,689	583,220	604,356	621,118	644,602	664,602
Deaths to 1,000 of population	1.63	1.51	1.02	1.25	1.97	2.00	1.04	.65	.59	.78
Croup	412	325	317	250	420	438	334	318	280	313
Deaths to 1,000 of population .....	.82	.63	.59	.45	.74	.75	.55	.50	.43	.47

CLEVELAND.

(Diphtheria, including Group [membranous].)

1885	Deaths ..	21	15	14	15	9	9	12	6	11	23	21	28	184	205,000	.....	.89
"	Cases ...	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	422	.....	2.05	.....
1886	Deaths ..	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	229	205,973	.....	.....
"	Cases ...	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	350	.....	1.70	1.11

BOSTON.

(Diphtheria and Group [membranous].)

1885	Deaths ..	51	35	24	27	23	25	23	11	18	30	35	32	D. 334	400,000	.....	.83
"	Cases ...	164	117	108	106	101	108	85	54	64	123	119	111	1,263 C. 125	.....	3.16	.31 C.
1886	Deaths ..	29	25	26	22	22	30	22	27	24	38	25	39	D. 329	400,000	.....	.28
"	Cases ...	122	104	110	66	73	95	75	78	85	130	111	141	1,190 C. 94	.....	2.97	.23 C.

ST. PAUL.

(Diphtheria and Group [membranous].)

1885	Deaths ..	11	6	4	3	12	3	8	3	2	8	14	14	D. 88	111,394	.....	.79
														C. 44			.39 C.

DETROIT.

(Diphtheria and Group [membranous].)

1885	Deaths ..	46	22	21	20	20	11	4	15	24	29	20	36	D. 268	165,000	.....	1.62
														C. 56			.33 C.

CINCINNATI.

(Diphtheria and Group [membranous].)

1885	Deaths ..	17	3	5	7	6	3	7	8	7	15	9	13	D. 100	325,000	.....	.30
"	Cases ...	22	6	10	9	10	9	8	16	25	20	26	17	178 C. 114	.....	.54	.35 C.
1886	Deaths ..	13	12	4	7	10	10	18	12	23	27	42	17	D. 195	.....	.....	.60
														C. 169	.....	.....	.51 C.

TABLE V.

Mortality Statistics of Diphtheria by Counties in Ontario for the Five Years of 1882, 1883, 1884, 1885, and till June of 1886.

COUNTIES.	Population.	Year 1882.	Rate per 1,000 of Population.	Year 1883.	Rate per 1,000 of Population.	Year 1884.	Rate per 1,000 of Population.	Year 1885.	Rate per 1,000 of Population.	Half-year June, 1886.	Rate per 1,000 of Population.
Brant	33,869	16	.47	29	.85	15	.44	9	.20	14	.40
Bruce	64,774	26	.40	13	.20	4	.06	3	.04	1	.01
Carleton	64,103	88	1.39	46	.72	13	.20	44	.70	25	.40
Dufferin	20,536	6	.29	1	.05	4	.20	1	.04	10	.40
Elgin	42,361	29	.68	5	.11	5	.11	15	.30	11	.20
Essex	46,559	47	1.00	31	.66	71	1.51	94	2.00	50	1.07
Frontenac	42,555	20	.47	5	.12	14	.34	13	.30	8	.18
Grey	70,528	25	.35	13	.18	15	.20	0	.00	6	.08
Haldimand	24,991	9	.36	6	.24	1	.04	8	.30	1	.04
Halton	21,919	8	.36	7	.31	7	.31	3	.10	11	.50
Hastings	55,192	34	.61	16	.28	20	.35	37	.60	6	.10
Huron	76,525	25	.32	33	.40	10	.12	4	.05	9	.10
Kent	54,335	33	.60	8	.15	15	.28	29	.50	19	.30
Lambton	52,034	18	.34	11	.21	8	.15	18	.30	23	.40
Lanark	33,975	10	.29	20	.58	30	.87	8	.20	3	.09
Leeds and Grenville	60,164	79	1.31	68	1.12	66	1.08	59	1.00	15	.20
Lennox and Addington	26,484	18	.68	8	.30	9	.34	7	.20	0	.00
Lincoln	31,563	19	.60	9	.28	6	.19	6	.20	3	.09
Middlesex	93,081	47	.50	8	.08	13	.13	24	.20	10	.10
Norfolk	33,527	22	.65	7	.21	0	.00	6	.10	5	.10
North'mb'rland & Durham	77,390	48	.62	7	.09	20	.26	12	.10	3	.04
Ontario	48,812	25	.51	21	.43	21	.43	11	.20	0	.00
Oxford	50,159	41	.81	34	.67	8	.16	24	.40	3	.05
Peel	26,175	15	.57	17	.64	11	.41	8	.20	6	.20
Perth	53,686	34	.63	11	.20	3	.06	9	.20	4	.07
Peterboro'	34,648	16	.46	15	.43	8	.23	7	.20	6	.10
Prescott and Russell	33,022	27	.71	26	.68	18	.47	134	3.05	87	2.30
Prince Edward	21,045	48	2.28	3	.14	4	.18	6	.30	2	.10
Renfrew	40,246	28	.69	22	.54	21	.51	23	.50	11	.20
Simcoe	74,903	33	.44	20	.27	28	.37	51	.70	24	.30
Stormont, Dundas and Glengarry	66,017	50	.75	14	.21	17	.25	49	.70	30	.40
Victoria	35,163	27	.76	6	.17	30	.85	16	.40	6	.10
Waterloo	42,735	47	1.09	14	.32	5	.11	4	.09	0	.00
Welland	31,771	19	.59	7	.22	9	.28	10	.30	11	.30
Wellington	66,189	37	.56	22	.33	12	.18	22	.30	14	.20
Wentworth	66,952	29	.43	26	.38	63	.92	89	1.30	68	1.01
York	153,098	117	.76	85	.55	54	.35	106	.60	125	.80
Totals	1,923,610	1,220	.63	694	.35	668	.33	1,969	.45	1,630	.32
Total Deaths from Croup		469	.24	367	.19	261	.13	276	.14	Relative increase in 1886.	

APPENDICES.

THE CHAIRMAN'S ANNUAL ADDRESS.

To the Members of the Provincial Board:

GENTLEMEN,—Four years last March having elapsed since the formation by the Ontario Government of a Provincial Board of Health, it may fairly be considered in order to make a brief enquiry in the annual address from the Chair into the degree of accomplishment of the objects set forth in the Health Act of 1882 as the special work to be undertaken, and, if not in every particular attained, to briefly advert to the difficulties the Board has experienced in procuring a full accomplishment. The duties of the Board, as set forth in section 3, read as follows: "To take cognizance of the interests of health and life of the people of the province; to study the vital statistics and make an intelligent and profitable use of the collected records of deaths and of sickness among the people; to make sanitary investigations and enquires respecting causes of disease, especially of epidemics, causes of mortality, and effects of localities, employment conditions, habits and other circumstances on the health of the people; to make such suggestions regarding the prevention and introduction of contagious and infectious disease as they shall deem most effective and proper, and as will prevent and limit, as far as possible, the rise and spread of disease, and when required, or when they deem it best, advise officers of the Government and Local Boards of Health in regard to the public health, and as to the means to be adopted to secure the same, as to location, drainage, water supply, disposal of excreta, heating and ventilation of public institutions." Such, then, were the duties assigned us in 1882, varied in some particulars in the Acts of 1884 and 1885, but in all essentials remaining still our *raison d'être*. Under the Act of 1882, the functions of the Board were confined to the issue of sanitary literature, relating to the prevention and spread of contagious diseases, by pamphlets, circulars and the public press, advising Municipal Councils to establish Local Boards of Health, investigation into special causes of epidemic or endemic diseases and of mortality—suggesting to every municipality the advisability of establishing isolation hospitals, for the reception of persons suffering from contagious disease, subject to the regulations made by Health Officers of Local Boards—executive power only being given to the Provincial Board, on a proclamation to that effect issued by the Lieut-Governor in Council. The Health Act, then, under which the Provincial Board first commenced its work, was purely permissive; the extent and nature of it has been in previous reports fully described, therefore unnecessary now to be alluded to. That the administration and satisfactory carrying out of all the details of preventive medicine on merely advisory powers in serious outbreaks of epidemics is absolutely futile, was sufficiently demonstrated in the epidemic of Small-pox last year in the Province of Quebec, and but for the wise and prompt action of the Ontario Government in clothing the Medical Inspectors appointed by the Board to guard the frontiers of Ontario with additional executive Powers, our Province, unquestionably, would have suffered from a very serious visitation of the disease. In such emergencies the working of separate authorities almost of a necessity involves divided councils and delay, when compulsory notification, promptitude and vigour of action is imperatively required for practical sanitation. Acting under the power the Provincial Board was first invested with, and to which in a great measure it is still confined, it has been its endeavour by the diffusion of sanitary literature, holding of conventions and establishing Local Boards in almost every municipality of the province, to secure the carrying out of the various provisions of the Health Acts of 1882, 1884, and supplementary Act of 1885, and with, we have reason for believing, a good measure of success; but that much yet remains to be accomplished in the way of sanitary administration, we

cannot fail to admit. The purity, from disposal of sewage, of water supply in cities, and in towns and villages, where the ground water-level is within ten or fifteen feet of surface, or gravel soils, with privies in dangerous proximity, is yet open to question. Faulty sites of houses, imperfect connection of house-drains, with sewers, cheap, therefore dangerous plumbing, insufficient ventilation of buildings, public and private, still give occasion for animadversion. In large cities in England and in the United States for many years, by-laws have been formulated and acted on that in a very great measure suffice for securing healthy homes. They have reference to interdicting building on sites which have been previously used as a place for depositing garbage, or any offensive material, which may have rendered such site liable to cause buildings erected thereon unhealthy, until such material shall have been removed to the satisfaction of the corporation; the civic authorities providing regulations for the construction of the house drains, cellar, waste water and closet, connexion with street sewer and precautions against admission of sewer gas into the dwelling, by proper means against the unsealing of traps; registering in the city hall a plan of the plumbing, position of drains and connexion with street sewer, the same provided with an exterior shaft communicating with outer air above the eaves-spout, and at a distance from any dormer window. Previous to renting or selling any new building, notice should be given to the corporation of its completion, and only after examination and certificate from the city surveyor that every sanitary precaution enjoined by the city authorities has been complied with, should it be free for habitation. Recommendations of this kind, for the protection of the public against dangers to health from faulty construction, have been carried at our board meetings. The passing of the requisite by-laws for enforcement is vested only in the Local Board. If, therefore, no measures exist of protection loudly called for, particularly in the class of brick-veneered houses springing up in every direction, where the plumbing expenses are limited to a sum utterly inadequate for securing safety, the fault does not rest with the Provincial Board; and it is manifest that much remains yet to be done for the accomplishment of the purpose for which our Board was created. The question of sanitation should be reviewed as an all-round question, embracing the entire Dominion. Fevers and infectious diseases are no respecters of persons, the rich equally with the poor being the victims. Human life should not be weighed against cost. In the report of Royal Sanitary Commission, Dublin, 1879, it is stated that out of more than one thousand dwelling-houses inspected in Ireland, from noblemen's mansions to six-roomed houses, only twenty could be truthfully certified free from danger to the health of the residents; 480 houses so ill-arranged and constructed that foul gases had free entrance into the dwelling; 416 drains leaking sewage into basement sub-soil; 397 drains with defective functions; 238 drains devoid of arrangements for ventilation; many soil pipes with unluted joints passing through pantries or larders, polluting milk, butter, meat, etc.; pipe drains broken, or with leaking joints saturating sub-soil with sewage; drains under dwellings without sufficient fall; drains without proper intercepting traps, or without free current of air throughout; defective or ill-constructed water-closet apparatus. I quote these few out of a list of fifty-one specific insanitary and dangerous defects, discovered during sanitary inspection of dwelling-houses, in proof of the necessity for city councils in our Province to have in their employ a surveyor or sanitary inspector of buildings, on whose certificate of completeness the purchaser or tenant may enter into residence without fear of consequences. Unfortunately the public are not easily convinced of the necessity of all these precautions, when money has to be spent in order to avoid them, and are apt to view persons dilating on them as busy-bodies and alarmists; but as the members of the Provincial Board are medical practitioners, and the treatment of cases of typhoid, diphtheria and other preventible diseases, which, to a great extent, by the precautions they enjoin, might be avoided, and by the neglect of them cause a large addition to their incomes, they must have at least the credit accorded of firm belief in the opinions they express, as also of disinterestedness. The prime movers in the cause of preventive medicine are to be found in the medical profession, prominent among them, Dr. B. W. Richardson, Sir James Paget, and a host of others on the continent of Europe, Great Britain and America. To their labours and the most important co-operation of eminent sanitary engineers, the measure of success accomplished is to be attributed.

It has been shown by Mr. Edwin Chadwick, the father of modern sanitary science, that within the last twenty years there has been a great reduction of sickness on the entire population. In the army and navy the saving is from seventeen in each 1,000 to eight and a-half; in India from sixty-nine per 1,000 to twenty. This diminished death-rate has been from all ranks of life, from the Queen's household to the inhabitants of the poorest tenement. It is needless to remark that with a diminished sickness and death-rate, there is involved immense money-saving. Sir Robert Rawlinson, in an inaugural address at the congress at Dublin, 1884, of the Sanitary Institute of Great Britain, in speaking of the reduction of disease by sanitary work and regulations says: "In looking over the advances made in sanitary science it must never be forgotten that to undertake and perfect good works is one thing, but that to maintain them good is the main thing. It must be remembered that sewers, drains and waterworks are only means to an end; they are only good so long as they are sound, clean, and cared for. Again, the most complete works of sewerage and water supply may leave untouched the slums, lodging houses and room tenements, and these places may remain nests of contagious disease, out of which will continue to stalk the grim forms of typhoid, smallpox, diphtheria and cholera. There are towns in England where sewers and drains have been formed and a good water supply established, but whose scavenging and house inspection and cleansing, have been shamefully neglected. The first should be done, the latter not left undone." These remarks of Sir Robert Rawlinson sufficiently indicate the necessity for every Local Board having a staff of inspectors, proportionate to the population of the city or town, engaged in the work of reporting to the council every departure from sanitary requirements. The abundant water supply in Toronto and other cities of this Province, has naturally induced house owners and builders to add very largely to the number of water-closets; it is, therefore, a matter of supreme importance that the Local Boards of Health should vigilantly attend to the system of connection of the house drains with the sewers, otherwise the result of attempted removal of excreta must lead to sewage saturation of basement sub-soil, and mortality from typhoid and other preventible diseases result therefrom. It is too much the custom to attribute such results to the *malfeasance* of the plumber: that such charges are occasionally well-founded does not admit of dispute, but in justice it must be remembered that there are many firms in this and other cities of our Province who honestly perform their work, and who would indignantly refuse the great responsibility attaching to it, when the maximum sum named would be utterly inadequate for securing safety. The fact, however, remains that numerous instances have occurred of sickness and death resulting from wilful or careless performance of this vitally important work, and the necessity for legislation on this subject was apparent to this Board for the protection alike of the honest tradesman and general public. In conjunction with a Committee of the Sanitary Association of this city, composed of sanitary engineers, architects, builders and plumbers, the members of the Provincial Board prepared a draft of a bill of "rules and regulations to be observed in the construction of houses and buildings, and of the drains, soil pipes, and plumbing of the said houses, or other buildings within the municipality—requiring a registration of plumbers; examinations for inspectors of plumbing by a board nominated by the local officer of health, but submitted for approval to the Provincial Board; clauses in the amendment to Public Health Act having reference to the filing of a plan in the office of the medical health officer, showing the whole drainage system, from its connection with the common sewer or cesspool to its termination in the house, together with a specification, and sizes of all branches, traps, ventilating pipes and fixtures; no cast-iron pipe of four inches internal diameter to weigh less than forty pounds per length of five feet, and no cast iron pipe of two inches internal diameter, to weigh less than twenty pounds per length of five feet; regulations also for weight of lead pipes: Also to be read in connection with section 16, Schedule A, Public Health Act Regulations, for sites of houses on made soil; each house or building having a separate soil-pipe and drain passing through and out of it; protest against use of pan-closet, method of making connexion between lead and iron pipes, in connection with sections 4, 5, 6, 7, Schedule A, Health Act, 1884, granting power, under instruction of medical health officer, to inspectors to visit cow byres, dairies, etc.

The provisions of this Bill, if they had met with the approval of the Assembly, would have proved the means of a rapid advance in sanitation, but it would appear that in their judgment the people were not prepared for compulsory enactments, even on matters directly concerned with life and health, and the only result of this attempt at further sanitary legislation was an addition to the Consolidated Municipal Act, providing that councils of any city or town may pass by-laws for licensing and regulating plumbers.

The experience derived from the recent severe and long-continued epidemic of smallpox in the Province of Quebec, so unmistakably pointed out that vaccination and re-vaccination must be always and immediately available free of charge, not only to patients on first seizure, but to all persons liable to be affected from residing in the locality where this disease had broken out, and for securing the arrest of this loathsome disease, prompt isolation being also had regard to, that at the request of the Provincial Board Dr. Bryce undertook the task of preparing an Act to amend the existing Vaccination Act, having special reference to insuring the vaccination of all school children. The details of this Amendment Act submitted to the legislature, will be given in the report of the Committee on Legislation; it is needless, therefore, for me to make any further remarks beyond regretting that this also was left to the discretion of municipal councils.

Dr. Buchanan, the President of the Local Government Board of England, has, if I am correctly informed, admitted that the actual working under separate authorities necessitated the delay of a week before three cases of smallpox could be securely isolated, even when those cases occurred at the "Home" of the Princess Louise. Dr. Cameron, a member of the House, essayed for Preventive Medicine to be enforced under existing Acts with vigour and without attendant delay. He pointed out that in Glasgow, where it is not claimed that all the arrangements and details are carried out in perfection, the annual death rates from Smallpox have been reduced to nine per million, while in London they amount to no less than 226 per million. It was shown, before the unity of sanitary action was enforced in Glasgow, that the death rate from Smallpox was even higher than it was in the Metropolis; and statistics, the accuracy of which is not impugned, were given, which proved that just as practical sanitation for the prevention of Smallpox was more and more strictly enforced, so was the death-rate from that disease reduced, until the very results now recorded were attained. As I remarked at the commencement of this report, the work assigned us by the Ontario Government is yet incomplete; there is undoubted evidence of a greater amount of interest taken in the causes and prevention of disease, and if members of the House of Assembly would only take out of the range of politics measures called for by sanitarians to be judged only upon their merits, and if Municipal Councils would entertain less alarm on questions of cost, far more advanced legislation than is now existing would strengthen the hands of Provincial and Local Boards of Health, and the judicious expenditure of money by local authorities would bear fruit. Dr. Alfred Carpenter, at the 7th Congress of the Sanitary Institute of Great Britain, held at Dublin, 1884, read a paper on "Education in Sanitary work," from which I extract the following passage: "The working-men in Dublin are a power; here they can elect a majority of the representatives of the Council. Do they know what is meant by a death-rate? The town I reside in (Croydon) used to have a death rate of 26 in 1,000; it is now 16. That is, the lives of 10 persons out of every 1,000 are preserved to their relatives, who would, but for sanitary expenditure by the local authorities, and by private persons, be numbered with the majority every year. Let us suppose that the death-rate of Dublin were reduced from 28 to 16, it would mean that the funerals in the course of the year would be diminished by more than 3,000, a serious matter for the undertakers, still a trifle worth preventing. But it would also mean much more than this: for every death there are twenty cases of sickness, and if there are 3,000 fewer deaths, there would also be 60,000 fewer cases of sickness among the people every year. Let me ask members of benefit societies whether they can realize this fact; whether they can understand that for every death prevented, there are twenty cases of sickness also prevented. Let us suppose that 20,000 of the working-men belong to benefit societies. They have to pay in weekly or monthly payments sufficient to provide for a sick fund, the greater the sickness the more they have to provide for it. If sickness is permanently reduced, they will be able to permanently reduce their payments on this account." Dr. Carpenter, in this, his address,

dilates at great length on the varied benefits to be acquired by the enforcement of sanitary laws by municipal government; but the reasonable limit of an annual address from the Chair must preclude further extracts. I will, therefore, only briefly allude, in conclusion, to action taken some weeks back, at a special meeting of the Board called for the purpose of expressing an opinion on the present site of the cattle market in this city. The location in question, for a number of years past was not open to serious objection, as there was only a comparatively sparse population surrounding it; but of late years the growth of the city has principally tended westward, large manufactories have been established, around which very numerous new streets are to be found, the houses therein occupied by the artisans employed. From the employers and the employed, the Board have received numerous signed petitions requesting the Provincial Board to express an opinion on the proposed outlay of a large sum of money on the present cattle market, which they object to as depreciating the value of surrounding property at the present, and which, with the enlarged accommodations suggested for cattle, pigs and sheep, might prove a serious nuisance. Acting under section 3 of the Act for 1882, at this special meeting, our Board requested Dr. Bryce to communicate to the city council the opinions entertained by the Provincial Board on this question. The views, as set forth in his letter, will be submitted at this quarterly meeting for further discussion. There can, I apprehend, be no difference of opinion entertained by any member of the Board that the assumption, on which action was taken at this special meeting, of a very great increase in the cattle trade, consequent on the railway connections of this city with the Canada Pacific, was not a groundless one,—if so, it is certainly desirable that a cattle market, in a city whose rapid increase within the last five years warrants the belief that before very long its population may be stated at 200,000, should be placed in such a locality that would combine with ease of access, freedom from danger to the health of the inhabitants, and also favourable for the establishment of an abattoir which, before many years have elapsed, will have become a necessity. The City Medical Health Officer recently reported that the total number of butcher shops in the city was 143, of which 105, at the time of inspection, were found to be in a satisfactory condition. No mention was made as to whether on any occasion did slaughtering take place on the premises. Of slaughtering-houses, the report records 25, only five of which were reported as in a satisfactory sanitary condition. The By-Law requires that these premises should not be less than 200 yards from any dwelling, and not less than 70 yards from any public street. They were found to be from six to 300 yards from dwellings. In a conversation, recently, with Dr. Canniff, I learned that the blood found its way into the drains, was thrown on the ground, or leaked through the floors into the soil beneath. We may, perhaps without injustice, assume that only in warm weather are deodorants, and still less frequently, if ever, germicides employed; if the soil on which these slaughter-houses are placed happens to be porous, and in a thickly populated district, retaining this form of organic matter, which rapidly decomposes and emits offensive emanations, they would at all times be dangerous; but more particularly so when the ground water is rising, and driving upwards the gases contained in the interstices of its material. The almost general disuse of the wells, so wisely insisted on by the Local Board of Health, would probably cause a mere exchange of danger, the balance of noxiousness, however, although less apparent to the senses, is in favour of the clear, cold, sparkling, but nevertheless rightly condemned, well-water. Many other arguments, aside from the pollution of our sewers and soil from blood, might be adduced. Time will permit only of a brief allusion to one industry incident to an abattoir. I quote from a paper by Mr. W. G. Stryper, C. E., entitled a new process for treating and drying blood, so as to fit it for use as a manure without nuisance. The rapid manner in which the blood of animals decomposes, exhaling emanations dangerous to health, has presented considerable difficulty in preparing it for use. Blood contains about 75 to 80 per cent. of moisture, which has to be evaporated in order to prepare it in a convenient form for agricultural or other purposes. But the operation of drying, as usually performed, tends to aggravate the nuisance by the increased emission of noxious vapours. It has been generally known that the ordinary hydrated sulphate of alumina has the property of abating the nuisance arising from the decomposition of

blood, but the quantity necessary to do so is considerable, as it is almost impossible to thoroughly mix the dry sulphate with the blood so as to secure deodorization. Hydrated sulphate of alumina, however, as now manufactured, is very soluble in water especially in hot water, and I found that if the sulphate were previously dissolved in water all the difficulty would be overcome, as the solution so obtained could be added to the blood so as to be intimately incorporated with every particle of it. I found that so small a proportion of the hydrated sulphate of alumina, as the one-fiftieth or sixtieth part, when added in the form of a solution, was quite sufficient to entirely destroy the offensive odour, and the resulting mixture of blood and sulphate of ammonia could be afterwards dried for manure. This process is now successfully carried on at the Dublin and Wicklow Manure Co., as also on a very large scale at the Saladeros, or slaughtering establishment, at Monte Video, in the state of Uruguay. This manure, of the highest value for agricultural purposes, is sold at from six to seven pounds sterling per ton." Apologizing for having, you may consider, too long detained you from the work each quarterly meeting brings with it, I conclude with the hope that our labours, and the labours of Local Boards will conduce to the general acceptance of the Roman saying, "*Salus populi, suprema lex*"; that at elections, whether for seats in Municipal councils or the Legislature, the electors will enquire of the candidates whether they will work for a proper supply of pure water, for the proper guarding against the erection of houses that from faulty plumbing may be viewed as death traps, for the proper care that waste and refuse matter be removed from our midst before it has time to be the occasion of sickness, that our bays, rivers and streams do no longer be great sewers, and that the atmosphere of public buildings, dwellings, and school-houses, should not contain more than 0.6, or at the outside 0.8, of carbonic acid per 1,000 parts, by due regard being had to proper ventilation.

HEALTH NOTES OF A RECENT TRIP IN GREAT BRITAIN.

BY THE CHAIRMAN.

To the Members of the Provincial Board of Health:

GENTLEMEN,—You are aware that letters received by our Board early in the spring led us to entertain the hope that we should have added to the meeting of the A. P. H. A. this month, in Toronto, a good representation of members of the Sanitary Institute of Great Britain, as also of the Association of Medical Officers of Health and other kindred associations in the Old Country, and thus the said association would have attained a greater International character.

I am sorry to have to record that with the exception of the very able and well-known officer of health of the city of Glasgow, Dr. Russell, no sanitary representative from Great Britain was present at our convention. Had the period fixed for it been earlier in the year, I think a different result would have been attained, but it appeared very evident that a return passage late in October or November, was not devoid of terror to many who had experienced the sea sickness incidental to the short passage from Dover to Calais or from Liverpool to Dublin.

A short description of an institution in London for rapid and secure conveyance of infected sick to a line of hospital ships in the river Thames, near Purfleet, will, I think, be of interest to the members of our Boards, inasmuch as our great rivers might similarly be utilized, as locations for isolation hospitals, such locations conveying less terror of infection to the public mind than land sites. The particulars I gathered during a visit of inspection, made in company with a large number of English officers

of health and colonial representatives, to the river ambulance stations, situated at south wharf, Rotherhithe, north wharf, Blackwall, and west wharf, Fulham. From these wharves sufferers from smallpox are conveyed to the hospital ships at Long Reach, Purfleet. Every ambulance station contains coach-house, stables, kitchen, dormitories, disinfecting rooms and other offices adapted to the wants of the resident staff. At these several wharves, completely isolated, are always on hand a number of admirably equipped ambulances for different varieties of infectious diseases; within fifty seconds of receipt of a telephone message to the nearest wharf of a case of infectious disease for removal to hospital ships, an ambulance is dispatched to the number of street or hospital in which the patient is to be found, with a nurse seated in the far corner provided with every requisite for comfort of patient *in transitu*, ambulance stretcher on rollers, thus admitting on arrival at the house of rapid removal and of conveyance to the chamber of patient, who, placed in the vehicle, is quickly conveyed to the wharf nearest to residence. The three ambulance steamers, *Red Cross*, *Maltese Cross* and *Albert Victor* are employed for conveying the sick to the hospital ships at Long Reach, Purfleet. The *Red Cross* is 105 feet in length, with a beam of sixteen feet six inches, drawing four feet six inches; can carry sixteen patients lying down and 150 sitting-speed, ten knots. *Maltese Cross*, on which we took passage, is 132 feet long and sixteen feet six inches broad, depth, seven feet six inches; can carry thirty-six patients lying down and 200 sitting-speed, ten knots; *Albert Victor*, nearly the same dimensions as *Maltese Cross*. The patients who are too weak to walk are lifted in the stretcher from ambulance waggon and carried direct on board, to either the forward or stern hospital on board steamer; a doctor and nurse can be found in each to accompany the patients on passage down river until arrival at Purfleet, where in line are to be found the three hospital ships, *Atlas*, *Endymion*, and *Castalia*, moored in line one behind another in the order named. The *Atlas* is a large three decker man-of-war, purchased from the Government, we were informed, for little more than the value of timber, 284 feet long, fifty feet broad. A large hatchway twenty-four feet by eleven feet six inches has been cut through the upper and lower decks in the centre of the ship, and forms a most efficient ventilating shaft for the egress of the impure air from the wards, while the fresh air is introduced through a long series of windows, replacing the ports. Patients distributed in these long wards, accommodating in all 150, but on emergency 200, could be treated on board. The *Castalia* is a twin ship, bound together like Siamese twins, built at the same time as the *Douvre et Calais*, with the expectation that sea sickness would be avoided, but proving unsuccessful as a channel boat was bought by the Metropolitan Asylum Board. On the upper deck five detached huts or hospitals are to be found, the two end ones fifty feet by twenty-eight feet, the remaining three fifty-four feet by twenty feet; lower deck of ship divided by iron bulkheads into five wards, two end ones semi-circular, with a radius of thirty feet, the remaining three rectangular, sixty feet by thirty feet, the windows so placed that cross ventilation is secured. The ventilation on the lower deck is further secured by two large apertures made in the roof of each hut, funnels carried up surmounted by large Boyle's exhaust cowls. These draw up the vitiated air, while the fresh air is introduced by means of apertures near the floor, fitted with a series of hot water pipes, around which are revolving fans, thus warming it before entering the ward. *Endymion* is a steam frigate, lent by the Admiralty, 277 feet long by forty-two feet broad, moored between the *Atlas* and *Castalia*, connected with each of these ships fore and aft by covered gangways. This vessel is used as an administrative ship, on which the staff, nurses and employés live when off duty, and here the cooking and other administration work is carried on. Warming of all three ships is effected by hot water pipes.

On the quarantine grounds, near which the ships are moored, are situated lavatories, amusement room for nurses, and bath-rooms, said nurses allowed only at long intervals to leave the quarantine ground on a visit to relations and friends. Before doing so they have to go through the following ordeal:—Entering the first of a series of three rooms they there remove every article of clothing, and enter *puris naturalibus* into the second or bath room; in the bath with flesh brushes and carbolic soap, they are enjoined not only to remove possible infectious germs from the surface of the body, but to

thoroughly wash the hair; this accomplished they enter the third room, where a complete set of clothes is to be found free from all suspicion of infection. Thus dressed they pass through a passage—having no communication with other nurses—to the shore, where the boat is awaiting them for conveyance to the nearest railway point for London.

On the large space of quarantine ground is to be found, in addition to the buildings for nurses, large buildings for heating by steam, and lighting by electric light the three ships described; also mortuary, post mortem examination and other buildings. In addition to these provisions for reception of infectious disease cases, with the sanction of the Commissioner of the Local Government Board, another very large hospital at Darent, on the opposite side of the river, was contemplated by the Metropolitan Asylum Board at a cost of forty thousand pounds, but the new Commissioner under Lord Salisbury's government has negatived for the present the proposal as too costly and unnecessary. Since 1884, when patients were for the first time taken by the steamer *Red Cross* to the hospital-ship, and since that time by the *Madus*, *Albert Victor* attached on service, to the close of 1885, no fewer than 11,600 patients were removed to Long Reach, the mooring ground of said ships, and 10,076 recovered patients were brought back to the London wharves. During the years 1884-5 there were 32,195 removals of fever and smallpox patients effected by the ambulances attached to those stations. The greatest number of patients conveyed down the river in one day was 104 by the *Red Cross*.

On the day I, in common with other colonial representatives and some forty English Medical Health Officers, was invited to make the inspection I have very briefly detailed, arrangements were made to entertain us right royally, dinner speeches following.

Among several medical *confreeres* from different States of the Union, passengers with me on board the ship *Egypt* of the National Line on returning home, I had the great pleasure of forming the friendship of Dr. Shakespeare, one of the Professors of the Pennsylvania University, who had been absent from Philadelphia a year on a mission from the National Government for investigation into the etiology of cholera as it appeared in Spain, Italy, and India, and in frequent conversations during our voyage, Dr. Shakespeare most kindly communicated to me the material for a few notes hastily taken at the time, giving me permission to communicate the same to the members of the A. P. H. A., convened this year in the city of Toronto.

In the first place, I learnt from him that cholera had not prevailed in districts where it was most expected in Spain to the extent it was deemed probable; on the other hand, in Italy, where it was considered likely there would be freedom from it, it prevailed, but not to such an extent as newspaper reports gave reason for crediting. For example, since March there have been no cases in Spain, while in Italy it has continued to the present time. In every case of cholera under Dr. Shakespeare's notice, the bacillus supposed to be causative was present in the *dejecta*, but in his opinion it has yet to be determined whether the bacillus is unquestionably to be viewed as causative or only concomitant. The universal presence of this bacillus, and its absence in all other diseases is absolute in Cholera Asiatica. The absence of it would indicate the approximate symptoms as belonging to Cholera Nostras, not Asiatic. The detection in the *dejecta* of this specific bacillus, comma bacillus of Koch, is sufficient in his opinion to unquestionably determine the nature of the disease, and on that discovery immediate action should be taken against the spread of it, Dr. Klein's opinion to the contrary notwithstanding.

Dr. Roy considered this comma bacillus a concomitant—viewed it as a vegetable organism, failed to find them in the cases under his notice in Italy, but found them in the cases in Spain. Dr. D. Douglas Cunningham accepts Dr. Koch's views that the comma bacillus is always to be found in Asiatic Cholera, and not to be found in health or other diseases, but hesitates to admit that it is the cause of cholera, notwithstanding they are always present, and that they prove equal to killing guinea pigs, exhibiting all the symptoms of Cholera Asiatica, only sometimes without the presence of diarrhoea. Dr. Shakespeare also informed me that he considered Dr. Brouardel's wholesale condemnation of Dr. Ferran's claimed efficacy of his attenuations in preventing the disease, of his strictures on Dr. Ferran's imperfect methods and laboratory appliances, as also of his arrival at the conclusion that he was endeavouring to obtain from his

government a large reward for his work, somewhat precipitate. He stated that he had visited his laboratory, and that although it was true that it wanted the appliances to be found elsewhere on the continent, in Great Britain and in America, and that it was neither large nor scrupulously clean, yet, notwithstanding, on his visit and examination of his processes for separating the particular germ from all others, and for care in mounting and staining, he found nothing to object to. Dr. Shakespeare considers that Dr. Ferran's conversation with Brouardel on the subject of money was in some measure misapprehended by that gentleman that Dr. Ferran was poor and in the talk of money grant, reference was had more to increased means for prosecuting his researches. With regard to Dr. J. M. Cunningham's *ex-cathedra* opinions of the non-contagiousness of cholera, Dr. Shakespeare inclines to the belief, from what he heard while resident in India, that Dr. Cunningham's opinions have undergone a change, although as yet no direct avowal of the same has appeared.

All of which is respectfully submitted,

CHAS. W. COVERNTON, M. D.,
Chairman Ontario Board of Health.

REPORT *RE* INSPECTION OF DR. STEWART'S VACCINE FARM, PALMERSTON.

To the Chairman and Members of the Provincial Board of Health :

According to instructions received from the Minister of the Department, through the Chairman of the Board, I proceeded on the 12th May, via Mount Forest, to Palmerston, to visit the Vaccine Farm, in company with Dr. Yeomans.

We found that the stables, which belong to Dr. Clark's brewery, not now used for brewery cattle, have been utilized by Dr. Stewart, and that as regards cleanliness, ventilation and space, they would appear to fulfil, in a marked degree, the conditions of cleanliness necessary to the success of such a farm.

Dr. Stewart had, at the time of our visit, but one calf vaccinated, and this one had only a few incisions on the posterior parts of both thighs, just enough to supply new lymph for a few points, and to propagate fresh seed. The animal was a grade Durham heifer of six or eight months old, and had every appearance of being in good health.

Dr. Stewart has, convenient to the stalls, a room in which the animal may be vaccinated and a frame on which the calf is placed when the lymph is to be taken. He proposes a more convenient table, on which the animal may be more readily placed.

Dr. Stewart finds that the vaccine vesicle matures within five or six days from the date of inoculation, and that the lymph, to be obtained clear and in amount, must be taken on usually the 5th day. This is, I find, the date, with the exception of Brussels, Belgium, where it is taken on the 6th day, on which the lymph is taken either for direct inoculation of another calf, or for storing, as given by Mr. Shirley F. Murphy, of the National Vaccine Establishment of Great Britain, for seven places, including London, which he visited, *i. e.*, Rotterdam, Utrecht, Hague, Amsterdam, Harlem, Brussels, London.

From the length of time in which bovine and arm-to-arm vaccine takes to mature, I had supposed that the bovine usually took seven or eight days to mature. I have not any positive evidence as to the time of maturation of the vesicle in United States establishments.

Vegetable ivory points are used by Dr. Stewart. When taken, he stands them base downwards in a groove in a stick padded with chamois; when thus treated, they are

taken to the office, allowed to stand there at the ordinary temperature of the room, and afterwards placed away in glass-stoppered jars, in a room kept cool by ice. When ordered they are packed in gutta percha film, and so sent away.

Such, as far as I was able to learn, are the chief points in Dr. Stewart's work, and with some variations, are those practised by most of the establishments supplying vaccine on this continent. Minutiae, and details of work of private farms, in a greater degree than here stated, seem difficult to get, *i. e.*, if they differ from the above; while from the successive references to the National Bovine Vaccine Establishments of Great Britain and the continent, published in the blue-books, but little can be learned, since it would seem that in London, etc., the calf-inoculations are principally used to renew, from time to time, lymph which may have been too frequently humanized, by this means tending to maintain the arm-to-arm vaccination in a state approaching true bovine vaccination.

Thus the total amount sent out from the Animal Vaccine Station of the Local Government Board in 1883 and 1884, was :

	1883.	1884.
Charged Ivory Points	9,249	13,139
Tubes (capillary).	2,151	114
Number of applications to Establishment for Vaccine.	1,666	1,770

As at the most the number of points, per application for vaccine, did not exceed ten, it is plain that the experience in bovine lymph of general practitioners in England is very small; while from the fact that two calves are inoculated weekly in the National Establishment in London, it is quite evident that an order for ten could, at any time, be at once filled, with almost perfectly fresh lymph, and by ready and rapid transit, and the systematic work done under the public Vaccination Act, can be in the small amounts ordered, always used when nearly fresh. Dr. Cory has stated that with perfectly fresh bovine lymph, 990 primary vaccinations in 1,000 have been successful. Again, with perfectly fresh lymph, human or animal, 99 per cent. of primaries have been successful at the various National Vaccine Stations. This rate is never obtained when stored lymph has been used. It is stated in the Report of the British Army Medical Department, 1882, that of 641 attempts at vaccination of recruits never before vaccinated that 166, or 26 per cent., failed altogether, and another 219, or 34 per cent., had modified vaccine pustules only. Thus 40 per cent. only of primary vaccinations were thoroughly successful with stored lymph. Returns already presented to the Board have shown how varying have been results in Ontario; but they, even though much vaccination was done in fairly cool autumn weather, and with an unusual demand, owing to the Montreal epidemic, make it abundantly plain that present plans, as practised on this continent or elsewhere, of both storing lymph and transmitting it, are crude and unsatisfactory.

These remarks have been introduced here in order that our position as a Board in regard to the Ontario Vaccine Farm may be made perfectly clear. The case which we have to deal with is not that of the London Establishment, where their chief care is to see to the keeping calves for a week or two and dieting them properly, before inoculation, to be sure they have no foot-and-mouth disease, and to keep, with absolutely fresh lymph, the supply of humanized vaccine lymph strong and pure; but our case is how, presuming that stables are good and animals healthy, we shall be able to see maintained in the Province an establishment so conducted, that presuming an animal having been inoculated, the lymph shall be taken at the proper date, in the proper manner, in the proper amount, and so dealt with when perfectly fresh that it can be forwarded to the vaccinator, either public or the private practitioner, in a state nearest that when just taken from the vesicle. Further than this we cannot go, except that we can teach, in season and out of season, that given all these desiderata, the lymph may be rendered speedily inert by the ignorance, neglect or carelessness of the vaccinator—not to mention heating in transit, etc.

A grant has been practically placed in our hands by the Government, with the order that we shall see that it be not spent unless we can assure them that it is being devoted to the development of an establishment supplying in everyway vaccine, not cheaper in price, but superior in results to that already in our market.

To us the question simply is—can it be done, and if so, how? I have, I think, both by statistics and facts regarding fresh bovine virus, shown how crude and unsatisfactory present supplies, both in Britain and United States, are, and at present I think we may conclude that Dr. Stewart's Farm is neither better nor worse, except in so far as our Canadian climate may be better, and worse because as yet his experience is limited.

To answer the question I have put for ourselves, I would in the first place say that, given clean, airy stables, and healthy calves, given a careful watching the temperature of the animal vaccinated, the maturation of the vesicle, etc., we are to look to the biologist for the secret of success in the future treatment of the vaccine virus. Our object must be to maintain the lymph so that vaccinations will approach 99 per cent. of successes in primaries, and this must be by preventing organic change or putrefaction in the lymph. Referring to *B. Termo*, *Spirillum*, and other agents of putrefaction, Sternberg sums up his remarks by quoting Duclaux, who says, "without them organic matter, even exposed to the air, would not be destroyed, or would be transformed with extreme slowness, in consequence of a slow combustion produced by oxygen. With them on the contrary, its destruction takes a rapid march and becomes complete."

How, then, are we to prevent this organic change?

By 1st. Removing air with its bacteria—always present;

2nd. Removing moisture, making decomposition impossible;

3rd. Removing heat, which makes decomposition rapid.

In practice, as regards vaccine, this appears to me to mean:

(a) Dry ivory points in a hot oven, then charge as soon as possible thereafter.

(b) Maintain in every way possible vaccine vesicles unbroken.

(c) Charge all the points at one sitting, never touching a vesicle a second time.

(d) Place the charged points at once under a clean bell-jar with hygroscopic substances to absorb moisture.

(e) Keep bell-jar always cold by surrounding it with ice.

(f) Exhaust, when jar is conveniently filled, the air from the jar, which likewise means the moisture both of the air and the lymph.

(g) Leave the jar thus exhausted, surrounded with ice, say, for 24 hours, then either store the points (h) in a tightly covered glass jar, with a piece of hygroscopic substance, or pack them at once in such a material as will exclude air and moisture, then placing these, with hygroscopic substances in jar, in refrigerator.

(i) Send, with date when charged, directions to physician to use all at one sitting if possible, and if not, to have them closed up tightly and stored away in a cool, dry place.

More than this we hardly need try to do. This much I think we may fairly insist upon. Require less than this and I think we need not expect to obtain results in any way superior to those from the vaccine of reputable United States establishments.

Remembering that the claim made upon the Legislature for aid was that Ontario might have, not a cheaper, but a better supply than she has hitherto obtained, I conceive that it becomes the plain duty of the Board to insist that, in recommending the payment of a part or the whole of such a grant, the recipient of the grant give ample proof that every endeavour is being made by him to carry out the views of the Board regarding the intention of the Legislature when making the appropriation.

Whatever may be the opinion of the Board on the views presented in the report, I trust that it will state, by resolution, what in its opinion is necessary that I should see carried out.

All of which is respectfully submitted,

P. H. BRYCE, Secretary.

TORONTO, Dec. 14, 1886.

To the Chairman and Members of the Provincial Board of Health :

GENTLEMEN,—In accordance with the Resolution adopted by the Board, I have made my second visit to the Vaccine Farm at Palmerston in company with Dr. Yeomans, and have the honour to inform you that matters were found in a very satisfactory condition, and there is evidence that every effort is being made to have a regular supply of lymph kept on hand and in the highest state of purity and activity. The various difficulties connected with the practical work were discussed, and interesting results of Dr. Stewart's experience were given. We were shewn an inoculated heifer at the fourth day of development of the disease and found her a healthy animal vaccinated with every possible care. We were likewise shewn the method adopted in securing the animal while the lymph is being taken.

The stables continue to be maintained in a healthy and cleanly condition, and the animals to be vaccinated are of good quality.

Dr. Stewart is desirous of making his work as thorough as possible and has adopted whatever suggestions are likely to assist him to this end.

He has furnished me with a brief statement of work done and results which I append.

PALMERSTON, Dec. 15th, 1886.

DR. P. H. BRYCE.

DEAR SIR,—Referring to your request for a report of Vaccine Farm I would submit the following :

I have vaccinated during the year about one hundred heifer calves, and, with very few exceptions during the hot season, they have taken successfully. I find that the vesicles mature in the cold weather in five or six days and the crop of vaccine lymph at this season is more abundant, and more effectual vaccinations follow.

In hot weather I have found in some instances the vesicles to have taken twelve or thirteen days to mature and the resulting lymph scanty and less effectual.

With regard to the drying process I have adopted the one recommended by yourself, viz : a small tin refrigerator well supplied with ice, in the bottom of which is placed a shallow vessel containing strong sulphuric acid ; the points are placed on the shelving in the upper part of the refrigerator for about three hours which I find quite long enough to dry them thoroughly ; they are then put in glass stopped bottles and kept in an ordinary refrigerator.

The demand for vaccine during the year has been very small, owing to the general vaccination last year I am happy to say, however, that the profession and Local Boards of Health in the Province have given me a very fair share of their patronage and I have heard very few complaints of non-successful vaccination, but have received many congratulatory letters on the successful results.

Yours faithfully,

J. STEWART

Summary of Replies to Vaccination Circular, dated November 6th, 1885, making enquiries regarding the Results of Vaccination with different Forms of Lymph.

Total number of answers from Doctors.	By what Firm the vaccine was supplied.	Total number of Vaccine Points used.	Average percentage of successful "takes" in primary vaccinations.	Average percentage in re-vaccinations.	Miscellaneous.	REMARKS.
109	No. 1 Washington, D.C. " 2 Boston, Mass. " 3 Lancaster, Pa. " 4 New York. " 5 Chicago.	37116	No. 1=80.40 " 2=80.75 " 3=59.75 " 4=71.90 " 5=33.26	No. 1=68.80 " 2=57.70 " 3=52.54 " 4=46.60 " 5=31.62	A few points from the following places were received, but not a sufficient number nor data to give a correct average: Toronto—Lyman, Engleford, Ill., Drug-ists, Dixon & Co.	Some medical men did not keep a record of either primary or re-vaccination, and in a few cases, while a record of the primaries was kept, the re-vaccinations were not looked after. One doctor—Dr. Carter, of Burlington—got ten points of the Washington virus, nearly all of which succeeded, and those vaccinated by arm-to-arm process from the lymph produced by the original bovine vaccinations. He says he was fairly successful in this, both as regards primary and secondary vaccinations. Very few of the reporters adopt arm-to-arm vaccinations, as they say the people as a rule are strongly against such practice.

REPORT *RE* ABATTOIRS AND SLAUGHTER-HOUSES.

(Including Report *re* Toronto Cattle Market.)

I. — REPORT *re* THE TORONTO CATTLE MARKET.

To the Chairman and Members of the Provincial Board of Health :

GENTLEMEN,—In discussing the question of the position of this Board with regard to the proposal to perpetuate and extend the present Toronto Cattle Market, we have a number of points presented for our consideration :

1st. The present market and its condition in relation to the question of nuisances.

2nd. The proposed enlargement and improvements.

3rd. The legal status of this Board with regard to any action which might be taken in regard to the present market, as a means of preventing the perpetuation of the market on its present site.

4th. The urgency or advisability of action being taken by the Board.

1st. The present market and its position in relation to the question of nuisances :

(a) Site of Market, a clay hill-side.

(b) Drainage toward the Garrison Creek ravine.

(c) Uncovered yards.

(d) Covered pens with water draining toward them.

(e) Broken floors, and the manure tramped into the holes.

(f) Condition during wet, warm weather.

(g) Evidence of nuisance by the Local Board of Health, Members of Council, newspaper reporters, local public opinion.

(h) Undeveloped state of immediate vicinity, as regards buildings.

These points might all be discussed at some length, but the present and past action in regard to the market are probably as good and sufficient proofs as are necessary, that the present market is unsatisfactory and a nuisance.

2nd. The proposed enlargement includes in its consideration : (1) Provision for 1,100 cattle, 1,100 sheep, and 300 pigs ; (2) The arrangements for cleanliness ; (3) The local injury to property, and to city development.

I have endeavoured to form an estimate of the amount of *excreta* daily produced, were the number of animals provided for in the new scheme present in the pens.

Alderman Frankland, according to newspaper reports, provides in his scheme of improvement for 1,100 cattle, 1,100 sheep, 300 hogs.

From *Tables* prepared from various reports, the following animals give of *excreta*:—

	Excreta.	Water dry solids.
1,100 cattle = $27\frac{1}{2}$ tons.....	55,000 lbs.	16,500
“ “	Urine. 44,000 “	1,320
1,100 sheep	Excreta. 6,111 “	1,832
“ “	Urine. 4,777 “	147
300 pigs	Excreta. 1,684 “	499
“ “	Urine. 1,302 “	40
	<hr/>	<hr/>
	$27\frac{1}{2} = 112,874$ lbs.	20,338 lbs.
	or 56 $\frac{432}{2000}$ tons.	10 $\frac{169}{2000}$ tons.

The calculations thus made are drawn from accurately prepared statements, prepared by the Professor of Agriculture, Guelph College, also from “Johnston’s Agricultural Chemistry,” etc., and are practically correct. From this it appears that Alderman Frankland’s scheme proposes to deal with a possible daily amount of animal refuse of fifty-six and a quarter tons of solid *excreta*, and ten and one-tenth tons of solids from the fluid *excreta*, or 2,542 gallons of urine in all.

Now, what is his scheme?

He provides for as many pens as there are car-loads of cattle brought for sale.

At the corners of each of 40 pens—cattle, 2 sheds; sheep, 22 pens; hogs, 5 pens, half uncovered; total, 69 pens—are gratings described as in next sentence:—

In forty-two cattle pens, it is proposed to have a grating with cess-pit (capable of being cleaned out), towards which from the sloping floor, all of the urine is drained, and in which the solid *excreta* are deposited; these cess-pits to be connected with a twelve-inch drain pipe; this into an eighteen-inch drain, which is to carry away all the fluids into the Garrison Creek sewer, and which is then to be deposited into the bay. What these amounts are have been already stated.

The whole of this is estimated by the City Engineer, with other improvements, to cost \$25,000. He provides, however, for more, or sixteen pig pens; but Alderman McMillan thought Alderman Frankland’s scheme might be started at \$15,000 in the meantime. Provided that the cess-pits are cleaned daily of their fifty-six tons of *excreta*, for which there does not seem to be any provision made in Alderman Frankland’s scheme, and of which the cost is not estimated, there is still the difficulty remaining that our bay would be polluted with 6,259 gallons of urine daily, a nuisance, the character of which may be illustrated by a visit to the Gooderham & Worts cattle byres, which, depositing the urine in the bay at a distance from houses, has been pronounced a nuisance by the courts already. Whether the present cattle market is a nuisance, or whether the improvements are going to lessen it or create a greater, remains for the Committee to decide. Regarding the nature of hog pens, with 300 or 400 hogs, there is abundant evidence before the Board from different parts of the country, of the pestilential odours coming from such piggeries, belonging to cheese-factories, even in country places, throughout the warm months; while the passing of a train loaded with hogs is for our purposes sufficiently illustrative.

I quote the following from a report *re* nuisances arising from piggeries in connection with cheese-factories:

“While in solids and fluids of a decomposable character, it is the *aerobies* or those *bacteria* producing fermentation of a less disagreeable character, which attack the sub-

stances first, there will, nevertheless, soon be set up a decomposition in the deeper parts of these solids and fluids by the *anaerobies* or *bacteria* of putrefaction, by which disagreeable gaseous compounds, as *acetic*, *butyric*, *valerianic* and other acids, usually combined with compound ammonias, are developed, and which, owing to the admixture of sulphur and phosphorus compounds, give off the putrid and disagreeable odours usually referred to in the process of putrefaction. Especially is this the case with regard to the nitrogenous matters contained in the solid *excreta* of pigs, which is of all barnyard manures the coldest, in other words, the slowest to ferment, and yet, which gives off, owing to this fact, the most repulsive odours of any. So strong, indeed, is this odour that when the manure is applied to the soil in large quantities the smell is imparted to the root crops to such an extent that Sprengel states the leaves of tobacco manured with it become unfit for smoking."

In connection with the question of nuisances from *excreta*, may be mentioned the inevitable and intolerable nuisance arising from the present lack of system in connection with the slaughter of the animals sold at the market. After being sold they are sent in droves through the heart of the city to slaughter-houses situated on every high-way leading into Toronto. These, being beyond the city, are scarcely, if at all, controlled; and hence suburban residence, throughout the summer and autumn months, becomes most undesirable.

These facts clearly point to the necessity for having abattoirs situated in the immediate vicinity of the market, thus getting rid of the inconvenience often caused by droves of cattle passing busy thoroughfares, the creation of nuisances on the leading highways coming to the city, and the dangers which the present lack of system encourages, which is summarized in the following resolution adopted by the Board as long ago as 1882. Thus I find in the minutes of a meeting of the Board, held Saturday, December 2nd, 1882, the following:—

"Moved by Dr. Cassidy and seconded by Dr. Covernton:—That whereas several dangerous diseases, *anthrax*, *trichinosis*, etc., may arise from eating the flesh of diseased animals; and whereas the stock brought to our large centres are often, from a long detention *in transitu*, entirely unfit to be slaughtered immediately upon their arrival; and whereas slaughter-houses are often kept in such a way as to impair the health of persons residing near them, it is in the opinion of this Board desirable that licensed slaughter-houses be established in the vicinity of our cities and towns, and both they and the animals to be slaughtered in them, be subject to the inspection of the Local Boards of Health and their executive officers. Carried."

The existence therefore of a cattle market, provided with proper structural and sanitary conveniences and abattoirs at some convenient point to the various railways, and as far as possible from present or probable centres of population, where the daily inspection of animals to be slaughtered may be carried on by a competent official, and where the supervision of the disposal of excreta and refuse from the slaughter-houses can be conveniently exercised, is, from the position of the present and prospective health of the inhabitants of Toronto, an urgent public necessity.

3rd. Regarding the legal status of this Board, as regards any action which may be taken:—

Act 1882, Section 3, provides for the Board's prosecuting, if, after the investigation, a present nuisance is found to exist. By Act 1885, Section 15, and sub-Sections 2 to 4, action would have to be taken through intervention of the High Court of Justice.

In view of the facts presented, it is for the Board to decide whether or not it ought to take action should the City Council proceed to extend the present market, owing to a by-law for its removal having from various causes been defeated. In this connection, too, it must be remembered that the Local Board of Health of the city has taken no action as yet in regard to preventing the continuation of the present market; but this may well have happened, since the scheme for extension and improvement has not yet passed the council. Should this scheme pass the council, the Local Board may then be fairly called upon by this Board to act under Section 36, 37, etc., Act 1884.

4th. We cannot, however, in this connection fail to remember that the Local Board and many of the city aldermen have already stated that the present market is a nuisance and a disgrace; that the Mayor in speeches has stated it as his opinion that the present was a case where it is the duty of the Board to act, and that, with one exception, every newspaper in Toronto has urged the removal of the market from its present site, both in the interests of public health, public decency and the development of the city in that locality, as well as the carrying out of the Park Drive scheme now before the people.

All of which is respectfully submitted,

P. H. BRYCE,
Secretary.

II.—THE SLAUGHTER-HOUSE AND ABATTOIR QUESTION—*Continued.*

Mr. Chairman and Members of the Provincial Board of Health:

GENTLEMEN,—I shall further discuss this subject by a remark taken from the work of H. P. Boulnois, C. E., Borough Engineer, Portsmouth.

He says in 1883: "The great necessity for the establishment of one or more slaughter-houses in any town can only fully be realized by persons who will take the trouble to inspect those which are private: they are generally placed near the shops of the butchers for the sake of convenience, the result being that they are situated in the central portions of the town, and are thus surrounded by closely packed dwellings. The private slaughter-house often consists of a stable or shed which has been converted into an ill-designed slaughter-house, badly paved, with imperfect draining. They are frequently not sufficiently lighted, ventilated or drained, and are utterly unfitted for the purposes for which they are used."

Such a statement can be made with at least as much force, regarding the slaughter-houses ordinarily found in Toronto and most of our Canadian towns and villages, and with even greater force of the barns or sheds wherein slaughtering is done in country places and the suburbs.

On the surface it might naturally be concluded that in any city or town of fair dimensions the desirability to the butchers of having a common slaughter-house or abattoir to which their animals might be driven for slaughter, would be so manifest that no opposition could be raised to any such proposition. Nevertheless, it is a remarkable fact, that practically the same objections and opposition from the same quarter, are raised in Ontario against abattoirs that are made by English butchers. As Boulnois remarks:—"Notwithstanding the loss in weight incurred by the animal to be slaughtered, thus fretting and sweating in its terror, the damage to the meat by its being dressed in the same locality with the live beast, steaming and smelling in the vicinity, and the exorbitant rents demanded, still there are great objections always raised by butchers in towns to the establishment of public slaughter-houses."

Here are the objections as given by Boulnois, usually made in England, and as far as I can learn practically, the same ones, raised by Toronto butchers against abattoirs. They say:—

1. That the carriage of the meat from the slaughter-house to their shop deprives them of some of their profits;
2. That slaughtering their animals in the presence of other butchers leads to disparaging remarks and trade jealousies;
3. That they are sometimes robbed of their tools, etc.

I add an objection of similar force, and one which I am told by a butcher present, was used at the meeting before the Mayor of Toronto, a month ago, by the butchers, viz:

that in a public abattoir, the possessor of a poor quarter of meat could readily impose upon and cheat his neighbour by exchanging his meat for a better quarter.

Dr. Orme Dudfield, M. H. O., Kensington, London, one of the foremost English officers of health, writing in 1880, says: "On the whole there has been a very considerable improvement in the condition of the slaughter-houses within the last few years, and I suppose it is as satisfactory as we can expect it to be, seeing that with one or two exceptions the premises were not constructed for the purpose to which they are applied, and that the localities are mostly unsuitable for carrying on the business."

This is what is said about slaughter-houses in one of the best London districts, in which the number had at that time been reduced to 29. The process of elimination seems, however, to grow gradually, until they hope to have done away with all private slaughter-houses.

The method by which this is done is by enforcing the stringent regulations of the Metropolitan Boards of Works.

Before any slaughter-house is licensed anew, a plan of premises drawn to scale must be submitted to the Board, showing proposed arrangements for drainage, lighting, ventilation, and water-supply, with answers to the following questions:

1. "State what place for the accommodation or poundage of the cattle about to be slaughtered is to be provided; if such place has an entrance way for the cattle otherwise than through the slaughter-house; if separated from the slaughter-house by a brick partition with a door; and also what provision is made therein for watering animals.
2. State if slaughter-house and its poundage is within twenty feet of an inhabited building; and if it has any entrance opening directly on a public highway.
3. State if the entrance to the premises is apart from and independent of any shop or dwelling house; if from a street at the side or rear; and also the height of the entrance gates.
4. State the dimensions of the slaughter-house, length, breadth, height to eaves, and construction of the roof, and give similar information about the poundage.
5. State if slaughter-house and poundage are drained by glazed pipes communicating with public sewer, or how; how drains are trapped, and if gratings have openings greater than three-eighths of an inch across.
6. State if floors are below level of outside road or foot-way, and if paved with asphalt, or flag-stone set in cement, or how.
7. State how walls of slaughter-house are constructed, and if they are covered with hard, smooth and impervious material to a height of at least four feet; and if so, state what material is used, and to what height it is carried.
8. State how slaughter-house and poundage are lighted, if with lantern, sky, side lights, or otherwise.
9. State how ventilated,—if by openings, windows, *louvre* boards, or otherwise.
10. State what provision is made for water supply, the capacity of the cistern, and at what height it is placed above floor-level.
11. State if any water-closet, privy, urinal, cesspool, or stable is within, or communicates directly with the slaughter-house.
12. State if any rooms or lofts are constructed, or proposed to be constructed, over the slaughter-house.
13. State if the premises will be provided with all the necessary and most approved apparatus and tackle for the slaughtering of cattle."

The following points are those everywhere urged, and I again quote from Boulnois, who urges like Dudfield, like the Louisiana Board, as indeed every author whom I have had time to consult, that private slaughter-houses should be replaced by abattoirs in all towns and cities.

In regard to abattoirs, Boulnois says :—

1st. As to site, this will depend upon the places at the command of the town.

2nd. It should be near the cattle market to prevent the passage of animals through the streets, not only on account of the great public inconvenience, but also the loss of weight to the animal (an ordinary beast is said to lose 340 lbs. in a journey between Edinburgh and London), and the heated and bad state into which it becomes from the exercise and the violent blows from the drovers' sticks.

3rd. Site ought to be isolated, and not too far from market, so that the price of meat will not be increased.

4th. It should be easily and effectively drained, and the more air surrounding it the better.

5th. It is most necessary that the live beasts be kept separate and away from the dead meat, and from where the slaughtering goes on.

Without going into the details of construction regarding any of the many good abattoirs existing in American, English, or continental cities, it may be said that it is necessary to have—

1. Places for keeping the animals to be slaughtered—properly laid floors, of course, and arranged with water and hay, well lighted and ventilated.

2. The slaughter-house, either separate or in one common long room, and separate slaughter rooms for sheep and pigs, properly arranged as to floors, drainage, protected walls, lighting, water and convenient machinery.

3. The condemned meat department—a place for suspected cattle, also place for slaughtering them, and keeping the suspected meat for examination. Meat gone bad after killing may be kept here.

4. Such meat is boiled down in some cities, in properly constructed boilers on the premises, with proper arrangements for dealing with it.

5. Special arrangements for pig-killing are necessary.

6. The *blood-house*. The blood is now utilized for making aniline dyes, and is carefully removed from the slaughter-rooms in covered galvanized iron tubes, and treated in the blood-room, the *serum albumen* run off and the solid residue removed for manure. (Vide also Introduction to Annual Report.)

7. The tripery for boiling the feet and rendering offal and tallow, with hide-stores, sale rooms, etc., is provided on the grounds.

8. Weighing-room, superintendent's room, and other departmental buildings are provided on the grounds.

9. Stables, carts for butchers' horses, etc., are provided.

Such abattoirs, varying in details and extent of completeness, exist in the larger cities on this continent, quoting from Dr. G. B. Thornton's report on the subject :

“ In all instances in this country, most notably New York city, Jersey City, Philadelphia, Chicago, New Orleans, Pittsburg, Cincinnati, and Boston, where the abattoir system has been adopted, it has proven far preferable to that of individual slaughter-houses from every point of view. It has proven alike advantageous to those directly interested and engaged in the business, and to the community at large. Under this system a proper sanitary surveillance can be exercised over every feature of the business, which is impracticable with the present arrangement of individual slaughter-houses with their accompanying stock-yards. It is a well-known fact that many diseased animals, and others in improper condition, though not diseased, are killed for the markets, and the meat sold to consumers as unobjectionable, though unfit for food. In many instances this

is done ignorantly, and of course innocently of wrong-doing, in others with a full knowledge of the fact. Cases of tape-worm, trichina spiralis and low grades of fever, etc., have been correctly attributed to eating impure meats, though fresh from the slaughter-houses."

For these and many other reasons fully set forth in this report, under the "Decomposition of Albumenoid Substances," this matter must be constantly kept before the public until such a public opinion is educated as will place the larger centres of population in positions of immunity from the dangers herein and elsewhere so fully set forth.

All of which is respectfully submitted,

PETER H. BRYCE,

Secretary.

III.—A SERIES OF REPORTS *RE* NUISANCES ARISING FROM CHEESE FACTORIES, CREAMERIES, AND PIGGERIES CONNECTED WITH THEM; AND ON SOME REMEDIES PROPOSED THEREFOR.

To the Chairman and Members of the Provincial Board of Health:

GENTLEMEN,—In view of the importance of this subject, as respects the public health, I have deemed it proper to draw your special attention to it, owing to the very considerable number of cases of this character which have during past, but especially during the present year, been referred to this Board, as well as owing to the great difficulty there appears to be with Local Boards in dealing with them.

I conceive that these difficulties may be briefly summed up as follow :—

- (1) The difficulty arising from the double nature of the nuisance ;
- (2) The difficulty due to the ordinary location of cheese factories, etc. ;
- (3) The difficulty arising from the position held by those who frequently are stockholders, or proprietors of them ;
- (4) The difficulty there seems to be in devising a proper remedy for the evils arising from them.

A word or two may be said upon each of these points :—

(1) The nuisance arising from these factories is in the first place due to the nature of the refuse matter or whey remaining after the cheese has been abstracted from the milk. To understand how this becomes a nuisance we have to remember it is an animal matter, abstracted from milk—one of the very best culture fluids for microbes. After the cheese, which contains about 25 per cent. of water, 35 per cent. fat and 37 per cent. of caseine with small amounts of mineral matters, has been separated, we have left whey.

		Per Cent.
Composition of Whey.	Water	93.31
	Nitrogenous matters .....	.82
	Fat .....	.24
	Milk sugar	4.65
	Lactic acid .....	.33
	Salts .....	.65

We thus see that we have still remaining, a fluid with abundant nutriment, especially for yeast ferments, but also for the bacteria of putrefaction. While it is true

that the *aerobies* or air ferments, such as the yeasts, will be first in the process of fermentation by which this whey is reduced to gaseous matter, there will, nevertheless, be abundant food for the bacteria of putrefaction (*anaerobies*) in the deeper parts of the fluid by which, such gaseous compounds, as *acetic*, *butyric*, *valerianic* and other acids, which are usually combined as compound ammonias, are evolved; and from which, owing to the admixture of sulphur and phosphorus compounds formed in the deeper portions of the liquid, are given off those putrid, disagreeable odours, usually referred to the process of putrefaction.

We have, however, in addition to the whey, the largely nitrogenous products of the excreta of pigs, which is of all barnyard manures the *coldest*, in other words the slowest to ferment, and yet which has, due to these facts, the most unpleasant odour of any. So strong, indeed, is this odour, that when the manure is applied to the soil in large amounts, the odour is imparted to the root crops manured with it, and, further, as Sprengel states, it imparts so strong an odour to the leaves of tobacco manured with it as to make them unfit for smoking. It is evident, therefore, that Duclaux's statement holds good that those more slowly fermenting compounds, which, owing to their more complex constitution, are less readily broken up into their simple elements by bacteria, always throw off more pungent odours owing to the ferments being more largely *anaerobies*, or those which feed upon the contained oxygen—as well as using up the sulphur and phosphorus of such compounds.

I have thus indicated, in a somewhat exact manner, the nature of the volatile organic compounds produced by this industry, in order to make it abundantly plain that the complaints made to this Board are regarding nuisances, of the most serious and disgusting character, and such as ought to be, in the public interest, reduced to the smallest degree possible.

(2) The second difficulty is that due to the locality of these factories. They are usually in rural municipalities and often on the outskirts of villages. These latter are usually unincorporated, and so are under the supervision of township Boards, some of whose members are always living in parts not affected by the nuisances and who are therefore usually indifferent to the complaints, thinking that hyper-sensitiveness, regarding so necessary a nuisance in connection with a prosperous local industry, should not be encouraged. A greater difficulty, however, in this respect, is often owing to the fact that these members, as well as others, are shareholders in the factory, or are at least on good terms with the proprietors, since the latter take milk from them at so much a gallon.

(3) The difficulty arising from the position of those who are proprietors of the factory.

I have in the last paragraph anticipated, somewhat, what may be said regarding these proprietors. Any of us acquainted with the small hamlets scattered throughout the country are well aware that usually some three or four men monopolize municipal, educational and business positions, usually on account of their greater intelligence, enterprise and wealth. These, with some of the more progressive and well-to-do farmers, are those who build and operate cheese factories.

It is very natural that, when in such cities as Toronto we find soap factories, glue factories, and fat-rendering establishments managed in the crudest manner, as regards the disposal of their refuse, that factories in rural municipalities will not be likely to have their refuse disposed of in any manner indicative of a desire for, or the necessity of, practising the most sanitary methods. Communications such as those from Tweed, Moira, Vittoria, Easton's Corners, International Bridge, Thamesford, Exeter, amply illustrate this point.

This being the case it naturally follows that the mild representations of Local Boards, when made regarding these nuisances, have passed unheeded or been laughed at; or, as in the Moira case, the Local Boards having proprietors of these factories amongst their members have in a most tyrannical fashion attempted to muzzle public opinion. Since in large measure the ratepayers of a township are unaffected by the nuisance, it is idle to say that complainants have the remedy in their own hands at the next election, since

sufficient organized influence is always present to keep the indifferent from considering the question, especially when the bracing winter air of election day has *pro tempore* frozen up the odours of a past summer.

(4) The difficulty there seems to be in arriving at some solution regarding the abatements of the nuisance.

At first sight it would appear that Section 35, P. H. Act, 1884, and Section 10, Schedule A, are sufficient directions regarding the way in which a remedy may be found. Possibly they might be regarding the factory, where Local Boards are composed of independent and careful men; but this could not be expected in the various instances I have mentioned. Regarding the keeping of hogs, I think it can hardly be said that the provisions of Sec. 7, Sch. A, would be found equal to keeping 200 or 300 pigs from creating a nuisance, even where proprietors were most willing to comply with the spirit of the Act. What further action it would seem desirable for this Board to institute whereby many persons throughout the Province may be protected from a growing nuisance, I leave to its most serious consideration. No great hardship will be placed upon any proprietor or company should they be compelled to exercise sanitary precautions in regard to these matters, while an undoubted benefit would arise to themselves from an increased cleanliness in connection with an industry, one of whose chief conditions of success is the absence, both in surrounding air and water, of whatever may tend to taint the products through putrefactive agencies.

I have the honor to be

Your obedient servant,

P. H. BRYCE,

Secretary.

The subject thus introduced by the Secretary was referred for further action to a committee composed of Dr. H. P. Yeomans and Secretary.

The following is the Committee's first report to the Board :—

December 1st, 1886.

To the Chairman and Members of the Provincial Board of Health :

GENTLEMEN,—Many proprietors of cheese factories in Ontario are aware of the necessity for enforcing the utmost cleanliness in everything that comes in contact with the milk, also the necessity of cleanliness in and around the factory. They know by experience that the least particle of taint about the walls or floors of the factory will certainly be imparted to the milk. The result of carelessness in these matters is that the commercial value of the cheese is lessened and the reputation of the factory injured.

Manufacturers of cheese and proprietors of factories are continually urging upon their patrons the necessity of exercising the greatest care in regard to cleanliness in the production of milk and its delivery at the factory.

The accompanying circular, issued by J. W. Robertson, a cheese proprietor, illustrates this point.

OFFICE OF J. W. ROBERTSON,
HARRISTON, August 8th, 1885.

DEAR SIR,—Fine cheese can be made only from sweet and pure milk, perfectly free from all taint and impurity. It is your interest as well as mine to maintain the high reputation for fine cheese which our factory has acquired. I would therefore request that you see every day that the whey is emptied out of your can, and the can properly cleaned and aired as soon as ever it reaches the stand. When whey goes back in the milk cans, this is absolutely necessary. Here let me say, that the practice of drawing sour whey in milk cans is doing more to injure the Canadian cheese trade, and destroy its reputation in the English market, than all other causes put together. Milk should always, even in cool weather, be well aired by frequent dipping and stirring.

Are your cows regularly salted ?

Hoping for your attention to these matters,

I am, your obedient servant,

J. W. ROBERTSON.

Impure milk has been delivered at factories in cases where—

1. Cows were allowed to drink the water of stagnant pools, or water containing decomposing animal and vegetable matter.

2. When cows were allowed to inhale bad odors arising from the decomposition of dead animals lying exposed in pasture fields. Instances are recorded in which the manufacture of cheese has been interfered with by the delivery at the factory of milk tainted from this cause.

In some factories it is obligatory by by-law "That no one shall be allowed to send milk to the factory who has dead animals exposed on his farm."

When cows are allowed to drink impure water their health is impaired, and the impurity of the milk may be detected by the manufacturer in the appearance of the curd, impure milk from one cow being sufficient to contaminate a whole day's supply.

In cases where farmers use the whey at home for feeding purposes, the practice of carrying whey in milk cans has been known to result in impairing the purity of the milk delivered at the factory.

The acid whey has a tendency to wear off the interior polished surface of the cans, so that it is more difficult to keep them clean. In such instances a taint is communicated to the milk from carelessness in cleansing the cans. For this reason it has been considered advisable to discourage the practice of using milk cans for returning whey to farmers for feeding purposes.

Nuisances may arise near the factories from the following causes :—

1. The whey may be allowed to fall out on the ground at the place where it is emptied into the milk cans at the factory—whey may leak through the conducting pipes leading from the factory to the large tank, where it is stored for feeding purposes.

2. Cess-pools may be created in hog-pens, or in their vicinity, by the accumulation of liquid refuse from the pens. Negligence in regard to cleaning pens and disposing of the solid refuse, or carelessness in using disinfectants in and around the pens may occur.

Saw-dust has been used in the pens in order to keep them as dry and clean as possible. This is a measure remedies the nuisance arising from liquid and solid refuse in the pens. Carbonized saw-dust might be used for this purpose with advantage.

If the floors in the factory are water-tight the washings of the factory cannot leak through and create cess-pools under the floor. This precaution is almost universally observed in factories. A double floor, however, may be so constructed as to permit the washings to accumulate between the boards and create an uncontrollable cause of taint in the factory. Therefore the upper floor should be absolutely water-tight.

The washings of the factory consist of milk, whey, and particles of curd. These are especially prone to decomposition if allowed to accumulate in the warm atmosphere about the floor of the factory.

In a similar manner the floors of the hog-pens should be water-tight, so that the liquid refuse and washings of the floors may not accumulate under the floor whence it cannot be removed.

Cheese manufacturers are anxious to adopt any measures considered necessary to secure a supply of pure milk at their factories. They also are ready to do anything they can to keep the factories, hog-pens, and surrounding grounds free from cess-pools. The location and management of hog-pens, and the manner of conducting the whey from the factory to the feeding tank are questions which might be considered. No doubt improvements may be adopted and carried out which would remove all complaints regarding nuisances in connection with cheese factories.

Dry earth might be used in disposing of the excreta accumulating in hog-pens. The value of the manure treated in this way would render the dry earth system less expensive.

As this is a practical question we would ask the Board to appoint a committee to enquire into the matter and report at a subsequent meeting.

Your committee would further suggest that the Board authorize a special committee to communicate with the Secretary of the Ontario Dairymen's Association, and if favourably received, to make arrangements for bringing the matter before the Association at its meeting in January next. It is further suggested that, if practicable, this committee, acting in conjunction with a committee of the Dairymen's Association, devise a scheme which shall be brought to the notice of the Minister of Agriculture with a view to obtain his opinion regarding the advisability of legislation on this important matter.

All of which is respectfully submitted,

H. P. YEOMANS,
PETER H. BRYCE.

The Committee was continued, and by resolution of the Board was directed to take, if possible, conjoint action with the Ontario Dairymen's Association, with a view to having remedies suggested and adopted for the evils complained of.

The Committee attended the Dairymen's Association, and made such representations as caused a Committee of the Association to be appointed to act with the Committee of the Board in the matter.

The following extended report of the Special Committee to the Provincial Board contains the results of the deliberations of the Committee of the Association :

To the Chairman and Members of the Provincial Board of Health :

GENTLEMEN,—According to the instructions of this Board your Committee attended the meeting of the Western Ontario Dairymen's Association at Woodstock, on Thursday, January 14th.

Through the kindness of T. Ballantyne, Esq., M.P.P., President, an opportunity was afforded for presenting the question of complaints regarding nuisances existing in connection with cheese factories.

Your Committee also presented the following propositions for the consideration of the Association, viz :—In order to consider carefully the proposed changes regarding the construction and management of cheese factories it is necessary to consider :—

(1) THE CONSTRUCTION OF CHEESE FACTORY BUILDINGS.

1. A site should be selected that will permit of efficient drainage.
2. All floors of the buildings should be water-tight.
3. Suitable troughs or pipes should be so connected with the floors that all waste water and whey shall be conveyed to their several receptacles as recommended without any leakage under or about the buildings.
4. All slops from factory floors should be conducted in a water-tight trough or pipe to an underground receptacle, from which the liquid portion shall be removed, by an underground trapped drain of a length not less than 300 feet.
5. Whey should be conveyed in a suitable water-tight trough or pipe to a water-tight tank so as to avoid any leaking or spilling—care being taken to keep such tank clean.

(2) THE PROVIDING OF MILK.

1. Care should be exercised that cows are healthy ;
2. That cows have an abundant supply of wholesome and pure water ;
3. That cows have free access to salt ;

4. That no dead animals or decaying matter be left unburied in pasture fields or around the premises where cows are kept ;

5. That milk be freely exposed to the action of pure air and kept free from exposure to germs of contagious or infectious disease ;

6. And that the surroundings of milkstands should be free from all objectionable odours,—*e.g.* the emptying of whey at milk stand to feed hogs.

(3) THE DISPOSAL OF WHEY.

1. The practice of feeding whey from each factory at one place in pens or in a large field used for this purpose should be adopted ; also,

2. That water-tight troughs or pipes convey the whey to the whey-tank and that the tank be kept clean.

3. The common practice of carrying sour whey in milk cans is especially to be condemned.

(4) THE CONSTRUCTION AND MANAGEMENT OF HOG-PENS.

1. A site should be selected that can be thoroughly and efficiently drained.

2. All pens should be made with water-tight floors, and so laid that the refuse shall be conveyed in a water-tight trough to a water-tight receptacle where the solid portions may be allowed to settle.

3. The liquid portion of refuse should be removed from said receptacle and disposed of in an adjoining field, on the principle of intermittent downward filtration or irrigation as explained in pamphlet on "Disposal of Sewage," issued by Provincial Board of Health.

4. The residuum or solid matters in this receptacle should be removed and treated with dry earth as frequently as necessary.

5. All solid or other refuse from pens should be removed and treated with dry earth as frequently as necessary. In the ordinary factory 1,600 gallons of whey are daily fed.

6. Care should be taken to keep floors as dry as possible.

Your Committee also recommended the appointment of a committee composed of four of the members of the Association to discuss the question and to take such action as they might deem best on behalf of the Association ; as also have further power to confer with the Provincial Board of Health and adopt such practical measures as might be necessary to remedy the evils complained of.

This Committee met at Stratford on the 22nd of January last and adopted the following recommendations, which were based on those suggested by the Committee of the Provincial Board of Health :—

REPORT OF COMMITTEE OF DAIRYMEN'S ASSOCIATION.

To DR. H. P. YEOMANS,

Chairman of the Special Committee of the Provincial Board of Health :

DEAR SIR,—In pursuance of the resolution passed at the recent Convention of the Western Dairymen's Association, a committee, consisting of Thos. Ballantyne, M.P.P., Stratford ; H. Lossee, Norwich ; Jas. Dickson, Attwood ; and James Robertson, Harriston, met at the Albion Hotel, Stratford, and adopted the following recommendations to the Provincial Board of Health :—

Re CONSTRUCTION OF CHEESE FACTORY BUILDINGS.

1. Recommended that a site be selected that will permit of efficient drainage from all the premises being easily made ;

2. That in the construction of the building all floors be laid water-tight

3. That suitable troughs or pipes be so connected with the floors that all waste water and whey shall be conveyed to their several receptacles without any leaking under or about the buildings ;

4. That all slops from the factory floors, etc., be conducted in a water-tight suitable trough or pipe to a water-tight receptacle, and that liquid portions thereof be treated on the principle of intermittent downward filtration, or be used as a fertilizer without causing any dangerous or offensive odour ; solid portions composed of curd, etc., which would make manure, to be treated with dry earth ;

5. That whey be conveyed in a suitable water-tight trough or pipe to a whey-tight tank in such a way as to avoid leaking or spilling, care being taken to keep said tank clean by thorough washing.

Re HOG PENS.

1. Recommended that as far as practicable only such a site be selected as can be well and easily drained ;

2. That all pens be made with water-tight floors so laid that refuse would be conveyed in a water-tight trough to a tight receptacle.

3. That liquid portion of the refuse be removed from said receptacle and be disposed of in an adjoining field on the principle of intermittent downward filtration or irrigation.

4. That the residuum or solid settlings, if any in the receptacle, be removed and treated with dry earth.

Re DISPOSAL OF WHEY.

Recommended that the practice of feeding the whey from factory at one place (in pens or in a field used for that purpose), as preferable to that of having the whey returned to the premises of the different patrons, because when fed at one place, most of the whey is daily consumed before the process of decomposition is far advanced, be advocated. Advantage is thus taken of the greater feeding value of the whey, and the nuisance is minimized. Where sour whey is carried in milk cans there is danger of contaminating the milk from the cans or waggon.

Re TREATMENT WHERE WHEY IS RETURNED.

Recommended that while this practice is one which should be strongly condemned, still where it is practised the following precautions should be enforced :—1. Such conveniences should be provided that no whey will be spilled in loading, or be permitted to cause an offensive odour around the tank. 2. That no whey should be emptied or fed near a milk stand nor near where milk is kept.

Re PROVIDING OF MILK.

1. Recommended that care be exercised to see that cows are healthy ;
2. That cows have an abundant supply of good food and pure water ;
3. That cows have free access to salt ;
4. That no carrion or decaying matter is left unburied in pasture fields or around the premises where cows are milked ;
5. That milk is well exposed to the action of pure air ;
6. That surroundings of milk stand are kept free from all causes of objectionable odours.

The Committee also recommend that Local Boards of Health be instructed to use every reasonable means to secure the adoption of these recommendations by dairymen.

The question now presents itself to this Board as to the means to be adopted for the purpose of enforcing these changes or improvements generally in this Province.

The question of *impurity of milk* presents itself in this connection. Bad flavoured, tainted or impure milk has always interfered with the successful manufacture of cheese and butter. The sale of impure milk also in towns and cities has resulted in conveying and increasing disease, consequently various systems of inspection have been adopted. Here is a common ground upon which sanitarians and dairymen may meet.

The commercial interests of the country and the public health alike demand a supply of pure and unadulterated milk.

The sale of milk as an article of diet and the manufacture of butter and cheese at creameries and cheese factories are questions of interest to this Board from a sanitary point of view. In cities and towns, especially, infant mortality has been greatly increased by the sale of impure and adulterated milk.

Milk is the diet especially suited to children at that time of life, when they are least able to withstand the injurious effects of impure food. In order that it may be useful as an article of diet for children it should contain all the natural ingredients in their normal proportions. The people, therefore, look for stringent legislation against the introduction of impurities in milk and to prevent adulterations. They expect health authorities to enforce these laws. Diseases may be introduced into the human system by impure

milk. Tuberculosis may be mentioned as an instance of this. Tuberculosis is found among animals improperly housed and fed. Experiments have been made by feeding milk of tuberculous cows to other animals, which conclusively proved that this disease may be communicated through the milk of affected animals. Experience and observation also point to many facts indicating that the milk of cows affected with tuberculosis is capable of introducing the disease into the human system. In the second annual report of the Massachusetts State Board of Health it is affirmed that "milk from cows affected with foot and mouth disease may cause serious ill-health. The symptoms are loss of appetite, nausea, quick pulse, swelling of tonsils and sub-maxillary glands, an outbreak of vesicles upon the lips and tongue with a peculiar skin eruption."

Milk contaminated with pus from an inflamed udder or an abscess will cause stomatitis and diarrhoea in infants. The general care of housing cows, the treatment and care of milk, the influence of different kinds of food and water on them, are all subjects of interest to sanitarians.

The germs of contagious and infectious diseases have been known to be conveyed in milk.

It has been frequently observed and noted by manufacturers of cheese and butter that milk possesses the property of absorbing odours and taints of various kinds. The members of these associations are familiar with instances of this fact and we merely allude to it.

Epidemics of scarlet fever, typhoid fever, and other diseases have occurred and been transmitted by means of milk.

An epidemic of typhoid fever in the town of Eagley, England, was investigated by the Medical Inspector of the Local Government Board. It was found that a small brook had been used by mill operatives in such a way that large quantities of faecal matter were daily emptied into the stream. The water from this brook was used at a dairy. One of the workmen was ill with typhoid fever. There was no positive evidence that the milk was diluted with this water, but it was acknowledged that the milk cans were washed with it. Of fifty-seven families supplied with milk from this dairy fifty-five were attacked with typhoid fever; one hundred and forty-six persons were ill with the disease. The inspector said "Not one household to which the milk was traced was free from the disease."

In an epidemic of scarlatina in South Kensington, England, one of the first cases occurred in the house of a man whose wife milked cows. Milk from these cows was supplied to about twelve families. In six of these families scarlatina occurred in rapid succession, at a time when the disease was not epidemic and without any communication having taken place between the affected persons and those who bought the milk. Within recent years a number of epidemics of scarlatina and typhoid fever have been traced to milk contaminated with germs of these diseases.

Washing the milk cans with infected water, diluting the milk with impure water or exposing the milk to an atmosphere loaded with disease germs may lead to the contamination and consequent transmission of the disease.

Your Committee is glad to notice that the necessity of furnishing good and pure milk at cheese factories has been urged strongly at meetings of the Dairymen's Association.

The laws, or rules, laid down for the regulation of the milk supply at factories have been enforced by cheese manufacturers in several places. This has initiated a good and wise movement, calculated to increase the commercial value of cheese and also to lead to the enforcement of laws for protecting the public health.

At a meeting of the Eastern Dairymen's Association lately held in Belleville, this question was referred to by several members. Mr. D. M. McPherson, of Lancaster, Ont., refers to "the good reputation of Canadian cheese-makers in foreign markets at the present day." He suggests, however, "means whereby Canada can still make advances toward a better article and obtain an increase in price"; and says that it is not by the improvement and advance of a few factories that the good reputation of cheese can be increased, but by the large percentage of perfect make to the whole production."

The better the whole production of the cheese of a country the higher will be its reputation in a foreign market.

He suggests among other things, "the appointment of expert superintendents by counties or groups of factories, and the careful inspection of cheese before boxing." This suggestion has also been made by others, and carried out in some parts of the United States.

A system of sanitary inspection of milk has been tried in some States in the neighboring republic, with the object of preventing disease and protecting the public health. We will refer to one State, the State of New Jersey, where a law was enacted in 1880, under which an inspector was appointed. The work of inspection has reduced the quantity of impure milk offered for sale, and at the same time caused a steady yearly advance in the commercial value of milk.

The advance in price of a forty quart can from 1879 to 1883 amounted to \$134.20 in favour of each farmer, estimating the value for one year. The price of milk was very nearly doubled from 1879 to 1883, during the years of inspection.

For the purpose of inspection, the State was divided into sections, and assistants appointed. At several places local health authorities had charge of the work of inspection, without any expense to the State.

At Vineland an energetic and earnest Board of Health accomplished all that could be desired in inspecting and regulating the milk supply. In this town the quality of the milk was kept excellent by the constant supervision of the members of the Local Board of Health, and the work was well done, without any expense to the State.

In closing this report the Secretary of the Board says: "I would repeat what I have stated in former reports, that to do the work of inspection in a thorough manner, and to accomplish better results, more attention must be given to the subject by local health authorities. It is clearly the duty of these Boards to interest themselves in this matter, and while a general oversight should be maintained by a State inspector, the work and the burden of expense should rest on the local authorities."

As far as this view of the question is concerned our municipal and public health Acts provide for the inspection of milk in the interests of public health. Section 13, sub-section 10, of the Municipal Amendment Act "authorizes councils of municipalities to appoint inspectors and to provide for inspection of milk offered for sale and for licensing and regulating milk vendors.

Section 10 of the Local Health By-Law, in force in all municipalities in Ontario, unless repealed, provides for the inspection and regulation of cheese factories and creameries by the Local Board of Health, and Section 11 for the inspection of milk. The authority for enacting and enforcing Section 10 is derived from the Municipal Amendment Act.

In conclusion your Committee would recommend:—

1st. That an inspector or inspectors be appointed under the Minister of the Department, which inspector should have power to inspect nuisances and unsanitary conditions existing in and around cheese factories and creameries, and report to the Minister.

2nd. That they assist, under the direction of the Minister of Agriculture, in carrying out recommendations and suggestions similar to those made by the Western Ontario Dairymen's Association with regard to—

1. Construction and management of cheese factories, creameries, and hog-pens.
2. Disposal of whey and the providing of milk.

3rd. And that your Committee be further empowered and directed to act with the Committee of the Dairymen's Association, to secure such legislation as is necessary to carry out those suggestions.

All of which is respectfully submitted,

H. P. YEOMANS,
PETER H. BRYOE.

The following from Prof. J. A. W. Robertson, Instructor in Dairying, etc., Agricultural College, a member of the Committee of the Dairymen's Association, is an answer to an enquiry from the Secretary of this Board as to what progress in experiments was being made under his supervision.

GUELPH, 19th July, 1886

MY DEAR DOCTOR,—I have your favour of the 16th. I have borne in mind and put to a practical test some of the recommendations for dairies and their surroundings, which were discussed at the winter session of your Board. I am not yet prepared to report exhaustively on them, as long enough time has not passed to permit of a satisfactory trial. But, so far as shown, the application of the "downward filtration system" for the disposal of liquid refuse from hog pens, seems easily practicable and effective. I have had that system in operation for a short time, in connection with a hog-pen erected, mainly for the purpose of testing its suitability. Fifty hogs are kept. The pen is a building 60 feet x 24 feet. The liquid refuse is conveyed in two gutters to one end of the building, where they empty into shallow, open trenches in a field; the trenches are five in number, about one foot wide, eight inches deep, and each 150 feet long; they are from twelve to eighteen feet apart. Between the trenches and running parallel are covered tile drains, from two feet to two and a half feet deep. The liquid refuse is absorbed or filtered away before any very offensive odor arises from it. The land between the trenches has been sown with rape. A crop with deeper-reaching roots would have been better had the ditches been prepared earlier in the season. I will have samples of the water, as taken from the tile drains, analyzed and send you a report. I do not wish to say much to induce other creameries or cheese factories to adopt the filtration plan till we find whether it works well the whole season. I am already satisfied that it will just meet the case as to the disposal of sewage and slops from the manufacturing rooms of the factories. I do not take up your time by describing and discussing the method of construction for hog-pens, but I have been giving that point further attention and trial. However, as no change in these buildings could well be effected in the middle of the manufacturing season, it will be soon enough, if I send you plans and suggestions, accompanying a report on the "Filtration System" for the whole season.

Re these complaints which you have received, let me say that I have also listened to a number from residents near cheese factories and hog-pens; the blame is mostly laid on the latter. I have been away a few times, visiting factories for the instruction of cheese-makers. I cite two cases in point: At Bluevale, the resident physician attributed the outbreak of a fever (which he feared was typhoid) in the family of the cheese-maker, to the nearness of a foul-smelling hog-pen. In that case a little ditching, at a cost of a few dollars would have temporarily abated the nuisance. That I pointed out to the manager, and instructed him to have it done at once. I mention that case to shew how all immediate danger to the health of the community, and offence to near residents might have been avoided by a timely enforcement of the regulations already issued.

At a large factory near Listowell, complaint was made by some neighbours. The company owning the factory at once provided a large underground tank, into which all the liquid refuse is conveyed. Said tank is pumped empty, and the liquid, as manure, is conveyed to a farm twice or three times a week. I will follow up the case and learn whether any nuisance is caused by the distribution of the liquid on the fields.

I have nothing *new* that would interest your Board about the unhealthfulness of milk from cows improperly fed, watered, stabled or cared for. I am investigating, with a view to discover definitely the effects of the different treatments and conditions, on the quality of the milk, butter and cheese commercially. I have not convenience nor as yet the skill required in examining milk for the presence of such germs or spores, as I understand, are the immediate cause of outbreaks of diphtheria and typhoid fever. If you can spare the time, and would undertake the investigation, I will send you samples of milk for examination. I can by exposure, impregnate milk with such a taint as would greatly lessen its value for cheese or butter-making, and send you samples. You may be able to determine whether or not such a taint is but an indication of the presence of dangerous germs. It is also of importance to know as much as possible of the nature of these germs in such milk, and whether the presence of lactic acid and salt would impair or destroy their vitality. The taints, which in milk often give the taste and smell faithful warning of its unfitness for food, are either removed, or their presence is hidden by these agents, acid and salt.

Re a pamphlet, I do not think it would do much service before Xmas. If a concise and practical one were issued before the meetings of the convention of dairymen in January, 1887, I think many of its recommendations would be adopted for another season. This one is now too far advanced for much change to be made in factory surroundings. I will be glad to have a visit from you, when your time will permit.

I am,
Yours truly,

J. A. M. ROBERTSON.

DR. P. H. BRYCE, Toronto

REPORT OF COMMITTEE ON FOOD AND DRINKS *RE* REPORT *RE* PUBLIC ICE SUPPLIES.

To the Chairman and Members of the Provincial Board of Health:

GENTLEMEN,—Your Committee on foods, drinks, etc., begs leave to report certain facts which may well be considered from the standpoint of health, as well as from the legal standpoint, upon the question of *ice supplies*.

Ice Supplies from the Standpoint of Health.—The fact that water below 32° expands, of course explains the fact that ice forms first on the surface of water in most instances. The crystallization of the upper surface of water, like all similar processes, tends to eliminate from the crystal formed any foreign substance, and hence it is that the surface-suspended impurities of the water, except so far as they may become centres about which the crystals tend to form, are not included in the surface ice to the same amount that they were in the water, previously at the surface.

Examination of ice on a sewage-contaminated river, say the mouth of the Don, makes it abundantly plain, however, that dissolved impurities, *i.e.*, the colouring matters of urine are included in the ice forming at the surface. This being the case, it is but natural to suppose that microscopic organisms included in such impure waters might likewise be included in the ice.

Such has been found to be the case. Prof. Pumpelly, of Newport, N. J., tested ice as to the presence in it of active microbes, and states that ice in freezing does not free itself from or destroy these organisms, since he found that pieces of ice, taken from the centre of blocks of ice, in many instances infected sterilized beef infusion with the germs of putrefaction.

The impurities due to decomposition of sawdust found in ice taken at Rye Beach seem to have been the sole cause of an outbreak of sickness there, and was found to contain relatively to Boston ice much more *albuminoid* and *free ammonia*.

In a paper by Dr. Pengra, Michigan, the ability of a solution of urea in water to eliminate the urea by freezing, was tested. He found the following:—

100 c. c. of water contained before freezing.....	.83 grains
“ “ “ from ice.....	.58 “
“ “ of the water below the ice.....	1.3 grammes

In other words 40 per cent. was cast out by freezing to a certain depth.

Another experiment with grape sugar showed, by freezing, purification to the extent of 55 per cent., while another experiment with dissolved arsenic showed a purification to the extent of 40 per cent.

Hassell gives the following result of freezing:—

	Original Solution.		Ice.		Water Left.
Total solids.....	27.0	.....	3.0	.....	14.2
Chlorine.....	1.94	.....	0.9	.....
Lime.....	10.53	.....	trace.	.....	14.11

On colloids (e.g. egg albumen),

1,000 c. c. of solution of egg albumen was frozen solid.

50 c. c. of upper.....	$\frac{1}{3}$ = 3.015 grammes
“ “ middle.....	$\frac{1}{3}$ = 4.19 “
“ “ lower.....	$\frac{1}{3}$ = 6.87 “

Thus a gradual purification from above downward is shown.

It is thus abundantly plain from these experiments that there is danger in ice from impure water. This danger is, as will readily be understood, increased in ice from shallow and artificially made ponds, usually containing vegetable matters in larger amounts, and in which with rapid freezing and the relatively small amount of water left is likely to materially increase danger from such.

That real danger attaches to ice taken from sewage-polluted water, is hence abundantly proven, both by experiment and experience from sickness, and that this Board ought to urge greater care in the taking of ice, and exercise all legal powers for the prevention of ice taking from polluted water, does not require fuller exemplification.

Ice Supplies from the Legal Standpoint.—By some strange oversight there is nothing in the Municipal Acts giving councils power in so many words, to pass by-laws regulating ice supplies. The by-law of Health Act of 1884, similarly had this provision left out.

In the present state of the Health Acts, your Committee deem it proper to indicate what clauses they think may be so read as to give Local Boards and health officers power to regulate ice supplies.

(1) Public Health Act, 1884, Sec. 38 ; (2) Schedule A, Sec. 1 ; (3) Schedule A, Sec. 11.

These would seem sufficient for dealing with the evil in most cases when Medical Health officers' opinions are supported by the Board ; but in such instances as that referred to your Committee from the Medical Health Officer of Hamilton, Section 11 of Schedule A, seems to be the only one by which the medical health officer has power to do anything, and this can only be done by his first testing the ice and proving it to be relatively impure.

In the present unsatisfactory condition of the laws bearing on the subject, your Committee would strongly urge that the Committee on Legislation again press this important matter on the attention of the Minister.

We have the honour to be,

Yours respectfully,

P. H. BRYCE.

FRANCIS RAE.

REPORTS OF THE COMMITTEE ON SEWERAGE, DRAINAGE AND WATER SUPPLY, *RE* PROPOSED SYSTEMS IN STRATFORD, OWEN SOUND, ST. CATHARINES, BROCKVILLE, TORONTO AND CORNWALL.

TORONTO, 8th June, 1886.

To the Chairman and Members of the Provincial Board of Health :

GENTLEMEN,—Your Committee on Sewerage, Drainage and Water Supply, to whom were referred the proposed systems of sewerage of the City of Stratford, and of the Town of Owen Sound, begs leave to present the following reports of the sub-committee appointed to visit those places, and reports that your Committee concurs in the said reports.

Respectfully submitted.

WM. OLDRIGHT.

J. GALBRAITH.

STRATFORD SEWERAGE.

TORONTO, June 8th, 1886.

To the Committee on Sewerage, Drainage and Water Supply :

GENTLEMEN,—In accordance with your instructions I visited Stratford on June 1st. to examine the outlet of the proposed sewerage system, and to gain sufficient information to enable you to form a fair judgment of the merits of the scheme.

It is proposed to build a system of sewers in the City of Stratford sufficient to carry off, in addition to sewage proper, the roof water which falls during ordinary rainstorms, and also to intercept the ordinary flow of two small streams on the south side of the

Avon. It is not intended to provide for carrying through the sewers the roof-water due to the heaviest storms to which the place is liable, nor to carry the rain water falling directly on the ground. Provision will be made for carrying off, on the surface of the ground, this water, and also the over-flow of the above-mentioned streams.

After an examination of the record of the rainfall at Stratford during the last twenty-five years, as given by the Meteorological Department, I advised the enlargement of certain portions of the proposed system.

I also advised the employment of no pipes of less than 8 in. diameter.

Mr. Macdougall, the engineer, to whom the proposed scheme is due, has concurred in these changes.

It is proposed to carry the sewage of the north side of the city across the Avon, at John St., by an inverted siphon to connect with the main sewer, thus giving the sewage of the whole city a single outlet.

This is located on the line of Hamlet Street, which is, I believe, the city limit.

Five miles below the City of Stratford is a small village called Avonton; about three miles further on is the village of Avonbank, and three miles below this village the Avon joins the Thames river; three and one-half miles below the junction is the town of St. Mary's. The river passes through ordinary farming country between Stratford and St. Mary's.

There is a cheese factory on the Avon about three miles below Stratford, which I visited. I believe there is another one at Avonton.

At the time of my visit, very little rain had fallen for several weeks, and the river was consequently low. I measured the flow and found it to be between five and six millions of gallons per twenty-four hours.

In the driest season the flow would be considerably under this amount.

Stratford has a system of waterworks, the pumping capacity of which is two and one-half million gallons per twenty-four hours.

The consumption hitherto has not amounted to more than from three to four hundred thousand gallons per diem, of which it is estimated the Grand Trunk Railway uses one-half. The greater portion of the water used by the railway is carried off by the locomotives.

I think that it would be fair to estimate the amount of sewage which finds its way back to the river per diem, as not more than two hundred and fifty thousand gallons. If we consider the before mentioned volume of flow of the river a fair average, the estimated quantity of sewage would form about five per cent. of the total flow.

It is for your Board to decide whether it is advisable or not to throw this sewage directly into the river.

My own opinion is, that it would be advisable to allow the discharge of the sewage directly into the river with the thorough understanding that such an arrangement was to be considered as being only temporary, and that the city of Stratford should be prepared to erect purification works whenever called upon to do so by the Provincial Board.

In view of the future erection of such works, I do not think it necessary that the outlet should be as far down the river as Hamlet Street; I think that it might be made at any point between Hamlet Street and the island shown on the plan opposite the cemetery.

The erection of sewage purification works would probably necessitate the elevation of the sewage from five to ten feet by steam pumps.

One point in the working of the sewerage works which cannot be too strongly insisted upon, is that efficient means be provided for flushing the pipes.

In conclusion, I wish to thank Mr. Macgregor, the Mayor, and other gentlemen whom I met, for their courtesy in affording me every opportunity for gaining the necessary information.

All of which is respectfully submitted,

J. GALBRAITH.

OWEN SOUND SEWERAGE.

To the Committee on Sewerage, Drainage and Water Supply :

GENTLEMEN,—After leaving Stratford, I went to Owen Sound. There it is proposed to sewer that portion of the town lying on the east side of the Sydenham River. The pipes are intended to carry off both sewage and ordinary rainfalls, including in the latter case, the water which falls upon the surface of the ground, as well as the roof water. It is proposed to discharge the sewer water directly into the river at four points, marked A, B, C, D, in the plan submitted to the Board, and into the Sound at a point marked E.

The most thickly populated portion of the town is that which is proposed to be drained by the sewers, whose outlets are A, B, C, D, and the main question at issue is whether or not an intercepting sewer should be built, which would carry the sewage to some point down the bay.

The population of Owen Sound is 5,700 and that of the portion of the town to be sewered is said to be from 4,000 to 5,000.

There is a good gravitation-waterworks system, the supply for which is obtained from abundant springs. The consumption at present is 100,000 gallons per diem.

The waterworks manager, Mr. Parker, is of the opinion that with the present population there might be an increase of fifty per cent. in the consumption of water within a few years. He also informed me that in his opinion it was not probable that more than 200 water-closets would be used with the present population.

The minimum discharge of the Sydenham river at periods of low water is about 18,000,000 gallons per twenty-four hours. I am indebted for this information to Messrs. Wm. Kennedy & Sons, who, from their extensive experience in putting in mill wheels, are in a position to give reliable information upon this point.

Mr. Robinson, C.E., who originated the plans submitted to your Board, kindly accompanied me over the ground, and brought me to points where I could examine the flow of the river to advantage.

The river, where it is proposed to discharge the sewers, is from sixty to one hundred feet wide and nowhere less than five or six feet deep at low water. It is subject to irregular fluctuations of level, due to winds on Lake Huron and the Georgian Bay.

My opinion is that it will be perfectly safe to discharge the sewage into the river as proposed.

There will probably not be more than 200,000 gallons per day of ordinary sewage for many years to come; along with this will flow even in the driest season 18,000,000 gallons of pure water. The floods, which occur at least once a year, will sweep the river clean to its mouth.

I do not anticipate that in the case of Owen Sound there will be sufficient filth even to cause a nuisance.

With regard to the other features of the proposed plan, it will be unnecessary to say much.

It may be necessary to determine more closely the sizes of the various pipes, but such details may be safely left to the engineer in charge.

There are few towns which have the advantages Owen Sound possesses for securing a constant supply of water to the sewers, and it should not be difficult to build a perfectly efficient system at a minimum of cost.

I feel safe in giving it as my opinion that if any malaria makes its appearance, in consequence of the sewerage system, it will be because of neglect of ordinary precautions in construction, and not on account of the outlet.

I think that if an intercepting sewer were built, its object might be to a great extent defeated by flux and reflux of the water, due to the winds on the lake. To carry the

sewage so far as to avoid danger from this source, it would probably be necessary to erect pumping works.

In conclusion, I must acknowledge my indebtedness to the gentlemen already mentioned, and also to Mr. Rutherford, the Mayor, Rev. Mr. Mulholland, Chairman of the Local Board of Health, and other gentlemen, for their courtesy and kindness in furthering the object of my visit.

All of which is respectfully submitted.

J. GALBRAITH.

ST. CATHARINES SEWERAGE.

To the Chairman and Members of the Provincial Board of Health :

GENTLEMEN,—Your Committee on sewerage, drainage, and water supply, having been requested by the Chairman of the Board to consider the accompanying scheme for a system of drainage for a portion of the city of St. Catharines, begs leave to report as follows :—

Your Committee having met and obtained from Mr. Alan Macdougall, (the engineer by whom the scheme was proposed), a plan and some additional information, thought it would be advisable to meet with Mr. Macdougall and discuss the desirability of certain modifications of the scheme.

The proposal to have the upper portions of the joints of sewers open has been deemed objectionable, inasmuch as the open joints, if they permitted the passage of sub-soil water, might also permit the passage of earth or sand, and lead to silting up of the drain. They would also allow of the passage into the soil of sewage, especially when the drains are flushed, and of sewer gas. If laid in the clay (as would be the case throughout a great portion of the system), the open joints would be of little use for sub-soil drainage, even were they unobjectionable otherwise.

The following modifications have therefore been agreed upon :—

To drain cellars by means of porous tiles placed outside the house walls at a proper depth below the surface of the cellar floor. To give these porous tile drains trapped connection with the sewers or house drains (outside the house walls of course).

To properly grade the streets, digging gutters or water-courses at each side of the roadway to carry off the surface water and storm water. All these water-courses to be properly graded down to the railway ditch referred to in Mr. Macdougall's report as the point of outlet for the proposed sewerage system. This ditch to be kept free from vegetable growth and other obstructions by the corporation of St. Catharines.

Should the Railway Company object to the use of this ditch for these purposes, an offtake ditch to be dug by the corporation. The use of the railway ditch is a portion of the original scheme.

If at any place the grading of a water-course causes a ditch of such a depth as to be dangerous, a covered tile-drain should be laid at such place or places.

The diameters of the main sewers will be lessened in consequence of the exclusion of storm water, and of a portion of the sub-soil water.

With these modifications, in which the proposer of the scheme concurs, your Committee would recommend that the scheme be approved by the Board.

All of which is respectfully submitted,

WM. OLDRIGHT.
J. GALBRAITH.

3rd December, 1886.

BROCKVILLE SEWERAGE.

To the Chairman and Members of the Provincial Board of Health :

GENTLEMEN,—With regard to the accompanying proposed scheme for the sewerage of the Town of Brockville, submitted to your Committee on Sewerage, Drainage, and Water Supply, your Committee beg leave to report that they were doubtful from the information furnished whether the proposed point of discharge of the sewage was such that there would be no danger of any of the sewage being carried to the inlet pipe of the water works. Your Committee was of opinion that there had not been sufficient experiments and observation to determine this question.

Shortly after the first meeting of your Committee to consider the scheme, and quite independently of any knowledge of the doubts of your Committee, similar doubts were strongly expressed at a public meeting of the citizens of Brockville. Shortly after this Professor Galbraith was called upon in his professional capacity to prepare a scheme for an intercepting sewer with an outlet below the water works intake. He worked out the details of a scheme for delivering the sewage at a point in the river 1,000 feet down stream from the mouth of the inlet-pipe of the water works. This point seemed to him to be as far as he could safely carry the pipe with the grades that the ground allowed, but he reported that even this point of outfall was not to be adopted until further float experiments should prove it to be perfectly safe. The determination of the motions of the currents at the selected point of discharge must, of course, rest with the municipal authorities. The Provincial Board cannot be expected to make the necessary experiments and observations with the resources at its command ; but it should, in the opinion of your Committee, withhold its approval of either scheme till the necessary information is obtained to render it a matter of certainty that there are no currents from the end of the discharge pipe of the sewer system to the inlet pipe of the water works.

All of which is respectfully submitted,

J. GALBRAITH,
WM. OLDRIGHT.

3rd December, 1886.

TORONTO SEWERAGE.

To the Chairman and Members of the Provincial Board of Health :

Your Committee on Sewerage, Drainage and Water Supply, beg to report as follows on the proposed scheme for a system of intercepting sewers for the City of Toronto, submitted for the approval of the Board by the Mayor. The principal points which demand consideration are : 1st. The quantities and distribution of the sewage and surface water (including in the latter the flow of several creeks) to be disposed of. 2nd. The location, sizes, and inclinations of the requisite intercepting sewers. 3rd. The question whether pumping will be necessary in order to get the requisite fall ; and 4th, the point of discharge into the lake.

The first three points involve a large amount of engineering work which your Committee do not propose to discuss. They have therefore confined themselves to the consideration of the point of discharge alone.

Mr. Alan Macdougall, C.E., made float experiments in May and June, 1886, for the purpose of getting information respecting the currents in the harbour, on the south side of the island and between the east gap and Victoria Park. These experiments were made on 22 days in May, and on 13 days in June. The prevailing winds were westerly and northerly, although there were winds from all points of the compass. More than one

hundred float experiments were made at various depths from the surface to 22 feet below. A few floats were tried at a depth of 40 feet.

Speaking generally, about half the number of floats went easterly, and the remainder westerly. Of the floats set out south of the island, more went westerly than easterly, and of those set out opposite Victoria Park more went easterly than westerly. Mr. Rust in 1884, made float experiments opposite Victoria Park, between September 25th and October 19th, and came to the conclusion that the currents were principally due to the prevailing winds.

With so little knowledge, then, of the direction and action of currents between the proposed outlet and the in-take pipe of the water works, it would not, in the judgment of your Committee, be advisable to pour out so large an amount of filth at the former point. From a population of 300,000 people the amount of faecal solids would be from 23 to 28 tons per *diem*, (according to the calculations of different physiologists), and 78,000 gallons of urine. And it is well-known that the excreta form but a small percentage of the total filth entering the sewers and composing the sewage of a city. Calculating from page 15 of the report, the proportionate amount of sewage per *diem* for 300,000 would be 22,600,000 gallons per *diem*; but even calculated as in cities of Great Britain as 25 gallons per head, this would give $7\frac{1}{2}$ million gallons of concentrated sewage, and adding an equal amount for street washings, we would have 15,000,000 gallons yielding from 60 to 90 tons of solid organic matter.

It must be apparent to you that we should not pour out such a volume of filth into the bay without knowing whether or not some of it may flow towards the source of our water supply. If this should turn out to be the case, the constant effect on health must be bad, and in time of epidemics, such as typhoid fever, or the importation of a very small amount of cholera, the result might be disastrous in the extreme. Another way of putting the matter is to ask if the citizens would like to see the present filthy water front, as now seen at the ends of our slips, transferred to the neighbourhood of the eastern gap, or of Ashbridge's Bay, without being assured that there is no westward current from these points to the inlet crib.

The suggestion in the report that if the proposed outlet be found not suitable, an outlet might be made a mile or more to the eastward, indicates a doubt on the part of the framers which, we think, should be allowed full weight. In this connection it might be pointed out that such an extension would be all under the lake level, and that the additional head necessary to produce a cleansing current through the pipe can scarcely be spared, if at all, from the present low head. As above indicated, we do not propose to discuss the point whether gravitation will produce a sufficient current at all times if the outlet be placed as proposed, but it seems apparent that the head is small enough without being diminished by a further extension of the pipe a mile or two. Should this prove, on examination, to be the case, pumping would have to be resorted to.

The only conclusion that your Committee can come to under the circumstances is that there is not yet sufficient experimental evidence to justify the fixing of the outlet at the point proposed in the Engineers' report. They would advise, therefore, that only such work be commenced and carried on immediately as would be unaffected in any way, either by the position of the outlet or by the introduction of pumping, and that systematic float experiments be carried on for at least one whole season, or longer if necessary—in fact long enough to render it a matter beyond reasonable doubt that the drinking water is in no danger of contamination. There can be no doubt of the necessity for the immediate construction of intercepting sewers, but the matter is of too great importance to allow any mistakes to be made which might be avoided by making further experiments.

All of which is respectfully submitted,

WM. OLDRIGHT,
J. GALBRAITH.

Toronto, 4th October, 1886.

CORNWALL SEWERAGE.

To the Chairman and Members of the Provincial Board of Health :

GENTLEMEN,—Your Committee on Sewerage, Drainage and Water Supply, begs leave to report that it has examined the plans and specifications for the proposed water supply of the town of Cornwall, and recommends the same for the approval of the Board.

We would point out that the introduction of this scheme may necessitate extensive improvements in the system of sewerage.

Your Committee has not, however, been called upon to report on the sewerage of the town ; nor have any details thereof been laid before us. We therefore merely desire to draw the attention of the Board and through it, if thought advisable, of the municipal authorities of Cornwall to this probable necessity.

All which is respectfully submitted.

WM. OLDRIGHT,

Chairman of Committee.

Toronto, August 31st, 1886.

REPORT OF THE COMMITTEE ON POISONS *RE* ILLUMINATING GAS.

Mr. Chairman, and Gentlemen :

The increasing frequency with which cases of poisoning by illuminating gas have occurred of late years, has become a matter for serious consideration by those who are more particularly concerned with matters pertaining to the public health, and whose duty it is in this connection to point out ways and means by which such occurrences may be reduced to a minimum.

Illuminating gas, as ordinarily supplied to consumers, is poisonous, whether it be coal gas, derived from the destructive distillation of coal, or water gas, derived from the decomposition of superheated steam by passage over red hot coal or coke and subsequent charging with the vapour of hydrocarbons. It is not a single gas, but always a mixture of several gases. In the consideration of the composition and poisonous effects of illuminating gas, the mixture known as coal gas will be compared with that known as water gas. The composition of these mixtures is not by any means always the same, but varies somewhat from time to time, even in the same kind of gas made in the same place, and much more considerably in the same kind of gas made in different places and by different methods. These variations of composition are, however, not so great as to prevent the term "coal gas" or "water gas" from representing a tolerably definite mixture. According to the report of the State Inspector of gas and gas meters for the State of Massachusetts, for the year 1884, the composition of a number of specimens of *coal gas* from different towns and cities in that state was found to be as follows :—

	Varying from	To	Average
Illuminants	4.55	8.03	6.19
Marsh-gas	35.53	41.98	37.41
Hydrogen	39.53	52.12	46.38
Carbon monoxide	3.19	6.74	5.53
Nitrogen	0.85	9.66	3.72
Oxygen	0.00	1.81	0.25
Carbon dioxide	0.00	1.78	0.52

The same authority gives the composition of *water gas* in the various places as follows :—

	Varying from	To	Average
Illuminants	10.12	17.81	12.48
Marsh-gas	13.58	26.51	20.55
Hydrogen	27.77	43.99	36.34
Carbon monoxide	24.47	31.52	27.46
Nitrogen	0.92	5.72	2.56
Oxygen	0.00	.95	.26
Carbon dioxide	0.00	1.17	.35

Prof. Henry Wurtz, Ph.D., gives the following analysis of the water gas supplied by the Municipal Gas Light Company of New York :—

Hydrogen	38.05
Marsh-gas	11.85
Carbon monoxide	29.40
Carbon dioxide	0.10
Oxygen	0.10
Nitrogen	3.71
Olefines (vap)	9.29
Paraffines	7.50

The following is the composition of the Lowe water gas at Baltimore, by Dr. E. G. Love, Official Gas Examiner of New York city :—

Hydrogen	46.49	
Marsh-gas	11.75	
Carbon monoxide	21.51	
Nitrogen	4.30	
Oxygen	0.20	
Olefine gases.. {	Ethylene	6.50
	Propylene .....	.35
	Butylene .....	.15
	Ethane .....	.50
Paraffin gases {	Propane	1.00
	Butane	7.25
		<hr/> 100.00

Mr. N. Aubin, Dominion Gas Engineer, in his report to E. Miall, Esq., Commissioner of Inland Revenue, gives the following analysis of Toronto gas by Prof. Pike in 1880 :—

Hydrocarbons	9.22 per cent.
Marsh-gas (C.H.)	25.71 "
Carbon monoxide	21.50 "
Hydrogen	43.57 "
<hr/>	
100.00 per cent.	

and the same gentleman quotes in the same report an extract from a report on gas in England, showing that coal gas, as found there, consisted of the following substances :—

Marsh-gas	30 to 40 per cent.
Hydrogen	50 "
Carbon monoxide	5 to 10 "
Hydrocarbons	5 to 6 "

All the constituents of illuminating gas, except oxygen, are irrespirable, that is, they cannot supply the place of oxygen for breathing purposes, and, if breathed undiluted, will produce death from suffocation. Besides this negative power, which it shares with the other constituents of illuminating gas, carbonic oxide is conspicuous for poisonous properties, which are peculiarly its own. It is probable that it is the only essentially poisonous substance in coal gas and water gas.

Mr. Aubin, Dominion Gas Inspector, says: "The particular compound, to which may be attributed the deaths caused, by the accidental escape of gas in bedrooms is the carbonic oxide found in coal gas, but in larger quantities in water gas."

Of the poisonous nature of this gas there can be no question—chemists of the earlier, as well as the more recent periods have united in pronouncing it one of the most poisonous of gaseous products. Dr. Parkes, in his work on Hygiene, says: "Of the immense effect of carbon monoxide, *there is no doubt*. Less than one-half per cent. has produced poisonous symptoms, and more than one per cent. is rapidly fatal to animals."

Prof. Witthaus, in his work on General Medical Chemistry, says: "Carbon monoxide is an exceedingly poisonous gas, and is the chief *toxic constituent* of the gases given off by blast furnaces, from defective flues and open coal or charcoal fires, and of illuminating gas. An atmosphere containing but a small proportion of this gas produces asphyxia and death, even if the quantity of oxygen present be equal to or even greater than that normally existing in the atmosphere; 0.5 per cent. of carbon monoxide in air is sufficient to kill a small bird in a few moments and *one per cent.* proves fatal to small mammals."

Replies to Circulars, etc.—For the purpose of obtaining more definite information relative to the actual effects of illuminating gas upon the life of human beings exposed to it, a circular of inquiry was addressed by the State Board of Massachusetts to the health authorities of 216 cities and towns in the United States, having a population of more than *ten thousand*. Returns were received from 108 cities, from which it appears that 189 deaths have been recorded as due to the inhalation of illuminating gas, in the twenty years and six months included in the returns. Of these 189 deaths, 40 are recorded as due to coal gas, in the 20½ years of record; 45 as due to *water gas*, in the 7½ years of record, since its introduction, and *one* to a mixture of coal and water gas, leaving 103 in which the noxious cause was not specified.

It also appears, that in three large cities in which water gas has been introduced, viz.: New York, Baltimore and Brooklyn, with a population of over 2,000,000, there had been sixteen deaths from the inhalation of illuminating gas previous to the introduction of water gas, in a period of thirteen years, or 1.2 per year.

In the same cities, for the remaining 7½ years after the introduction of *water gas*, there were 120 deaths, due to inhalation of illuminating gas or 16 per year—an increase of more than 12-fold in the deaths, from this cause, while the population had not doubled in the same period. To carry the comparison still further, the two cities, Boston and Baltimore, are quite similar in the number of their population (400,000).

In Boston there have been but *four* deaths attributable to illuminating gas in 20 years; in Baltimore, in the same period, there have been 19 deaths from the same cause, 17 of which have occurred in 1883, 1884 and 1885. The former city uses coal gas for illumination, and the latter water gas.

The consumption of coal gas in England is very large. Mulhall's Dictionary of Statistics gives 71,600,000,000 cubic feet as the consumption for 1880—or 3,400 cubic feet for each inhabitant. Notwithstanding this enormous consumption, the death rate from gas poisoning was small. The population of England and Wales is estimated for 1883 at 26,770,744, and during the five years from 1879 to 1883 inclusive, only 24 deaths occurred from this cause.

A strong contrast to these figures are the results found in Brooklyn, Baltimore and New York, where water gas has been introduced. The population of these three cities was, in 1880, 2,105,469, and out of this number, which is less than 1-12 of the population of England and Wales, there occurred during the same period and from the same cause 77 deaths.

Symptoms of Poisoning.—The subjective symptoms of poisoning by carbon monoxide are said to be quite uniform. The first symptom noticeable is a burning feeling in the skin of the face; this is quickly followed by giddiness and headache, gradually becoming more intense, with a feeling of strong pulsation in the temporal arteries. In the early stage there is generally oppression at the stomach, nausea and vomiting, noises in the ears, imperfect vision, distress of mind, anxiety, and excitement, and at this stage insensibility often attacks the victim, who falls to the floor unconscious of standing or attempting to walk.

In cases of recovery, the most marked symptom is a feeling of weakness and fatigue, often lasting for several days; headache, a want of clear conception, and general obscurity of the mental faculties are also noticed.

In cases which end fatally, the victims either never wake from coma, or their wakening is transitory and imperfect.

The objective phenomena are mainly as follows:—In the early stages, the external surface of the body is congested and red, especially the face. The conjunctivæ are injected, and the mucous membranes are usually of a bright red. In the later, comatose stage, the skin is usually pale, and becomes livid toward the end of life.

Death usually occurs without perceptible spasms or convulsions, although convulsions do occasionally take place.

It appears from the experiments of Bernard and others, that the method by which carbon monoxide produces its fatal effects is by forming with the colouring matter of the blood, by displacing oxygen, a compound, which is quite stable, and thus causing asphyxia, by destroying the power of the blood-corpuscles of carrying oxygen from the air to the tissues. Owing to the stability of this compound, the symptoms of this form of poisoning are very persistent, lasting until the place of the colouring matter, thus rendered useless, is supplied by new formation.

The prognosis is very unfavourable, when the amount of gas inhaled has been at all considerable; the treatment usually followed, artificial respiration and inhalation of oxygen, failing to restore the altered colouring matter.

If we compare the analyses of coal and water gas, made by the Massachusetts Inspector of Gas, etc., it will be seen that water gas contains about five times as much carbon monoxide as coal gas; and, as carbon monoxide is by far the most poisonous ingredient in these illuminating gases, we must conclude that the one containing the larger proportion of it would be more poisonous and dangerous to life than the other. The following experiments, made by the Massachusetts State Board of Health, of which Dr. S. W. Abbott is the medical health officer, show that this opinion is correct.

Experiment No. 1.—Two rooms were made exactly alike, with a capacity of about 700 cubic feet; three dogs, two cats and two rabbits were placed in one room where water gas, containing about thirty per cent. of carbon monoxide, was allowed to flow in from a single, ordinary burner, at the rate of six feet per hour. The experiment began at 11.15 a.m., and at 12.45 p.m. vomiting, delirium, convulsions, etc., had already been noted. Half an hour later all the animals were unconscious, or apparently so, failing to respond to calls and vigorous knocks upon the walls. At 2.30 p.m., or three hours from the start, the two cats were dead and the other animals were prone and quite unconscious. The dogs died at 3, 4, and 6.30 o'clock respectively; the rabbits also at 6.30. In a word, symptoms of poisoning were well developed in one hour and a half; deaths began to occur in a little more than three hours, and all were dead within eight.

Experiment No. 2.—In the corresponding experiment with coal gas, containing about eight per cent. of carbon monoxide, two dogs, two cats, two rabbits and two pigeons were placed in the room, and the gas was introduced from an ordinary burner, and at the same rate as before. The experiment began at eight a.m., and for three and a-half hours no symptoms of consequence were observed, and then only drowsiness and general anxiety with salivation in one case. At four p.m., eight hours after the start, (at the end of which time all the animals mentioned in the first experiment, were dead) nothing more than a gradual exaggeration of the symptoms had occurred. Recovery apparently would have been still

possible and even easy at this time. After twenty-four hours one cat and one rabbit were dead, but the rest, though stupefied, were not unconscious, being still responsive to knocks and calls. There is little doubt, moreover, that as the night was extremely cold (below 0° F.) and the rabbit was young, it was somewhat chilled by the cold, and thus succumbed the more readily to the gases.

In a room containing 800 cubic feet capacity, which is about the average size of rooms in which fatal results have taken place, a six foot burner (*i.e.* allowing the escape of six cubic feet per hour), would introduce in eight hours forty-eight cubic feet, a little more than six per cent. of the air of the room. By careful experiment it is proved that at least more than half of this amount escapes, leaving less than three per cent. in the room at the end of eight hours. Of this amount, say three per cent. in the case of coal gas, from five to eight hundredths would be carbonic oxide, or from fifteen to twenty-five hundredths of one per cent. of the air of the room, an amount sufficient to produce headache, nausea, malaise and other symptoms of a like nature, but very rarely a fatal result.

In the case of water-gas escaping at the same rate and filling a similar room to the amount of three per cent., at the end of eight hours from seventy-five to eighty-five hundredths would be carbonic oxide, or nearly one per cent. of the air in the room, an amount which is inevitably fatal to healthy adults after an exposure of from four to twelve hours.

It appears from these observations, as to cases which have occurred, and also from the experiments of the Board, that in ordinary cases an exposure to coal-gas would produce during a night's sojourn in a small room such as has been described, severe and unpleasant symptoms and possibly insensibility, with a probability of resuscitation and complete recovery.

An exposure to water-gas under similar conditions would usually be followed by death in less than eight hours.

The remedies suggested for the prevention of accidents are:—(1) The use of automatic burners which would cause the gas to ignite immediately on escaping. (2) Limiting the minimum size of sleeping apartments and requiring thorough ventilation.

In view of the experimental evidence herewith submitted, it must be admitted by all that water-gas with its twenty-five per cent. of carbonic oxide, is a more dangerous substance than coal-gas, with its six or seven per cent., and the question would naturally arise as to how much practical importance may be attached to this more poisonous character. If we consider the various circumstances under which accidents are likely to occur as a result of the general distribution of gas for illuminating purposes, it will help to answer this question.

There are several principal ways in which such accidents are likely to arise.

1. By suffocation: as when workmen are overpowered in deep trenches by large quantities of gas escaping from broken or leaky mains;
2. By the formation of explosive mixtures with air, owing to the escape of the gas in any manner;
3. By poisoning during sleep: from the escape into the sleeping room of gas from the burner because, owing to defective fixtures, to accident, intention, or ignorance, the light has been put out while the gas is still allowed to flow in;
4. By the slow, obscure poisoning, especially of feeble or anæmic persons, owing to leaks in or about pipes or burners in ordinary dwelling-rooms;
5. By poisoning, especially at night, when doors and windows are generally closed, with gas escaping from broken street mains into the earth, afterwards passing through drains or through the soil to the basements of dwellings and thence upwards throughout the house.

Stoves, etc.—A fruitful source of carbon monoxide poisoning, sometimes fatal, but more frequently producing langour, headache, and debility, is to be found in the stoves, furnaces, etc., used in heating our dwellings and other buildings, especially when the fuel is anthracite

coal. This fuel produces in its combustion, when the air supply is not abundant, considerable quantities of carbon monoxide, to which a further addition may be made by the reduction of the dioxide, also formed in passing over red hot iron. This poisonous gas may find its way into rooms either through cracks and defects in the stoves, flues, or pipes, by occasional downward currents of air passing over fires in open fireplaces, or, much more frequently, by direct passage through the heated metal. Experiment has shown that metals, notably cast-iron, are quite pervious to gases when heated to redness. When, therefore, a stove or the fire-box of a hot-air furnace becomes red-hot, a portion of the gases formed by the combustion of the fuel, passes through the pores of the metal to contaminate the air without, and give rise to carbonic oxide poisoning to a degree depending upon the degree of imperfection of the ventilation, the nature of the fuel and the amount of air supplied to it.

The obvious precautions required to avoid this form of what may be called chronic carbonic oxide poisoning, and which is by no means uncommon, are:—

1. To see that the various pieces of which the stove or furnace is composed are well fitted and properly cemented, so as to insure as close a joint as possible;
2. To have the stoves or furnaces lined with fire-clay or fire-brick, which tends to prevent their being over-heated, and thus diminish their perviousness to gases ;
3. To avoid heating to redness ;
4. To have good pipes, well fitted, and entering a flue with a good draught ;
5. To furnish a plentiful supply of air to the fuel ;
6. To secure proper ventilation;
7. In the case of hot-air furnaces, to obtain, by an abundant supply of external air to the air chamber, a large supply of moderately-heated air, rather than a smaller supply of very hot air ;
8. To avoid placing dampers or other obstructions in the pipes leading from all stoves in which anthracite coal is used as fuel.

Note re Automatic Cut-off Gas-burner.—The automatic cut-off gas-burner, a sample of which was exhibited to the Board yesterday, might be used with advantage, more particularly in bedrooms, so as to prevent the danger of suffocation from inhaling illuminating gas.

It consists of two steel cylinders inclosed in a brass case, which can be screwed on to any ordinary gas fixture.

The outside cylinder, open at the upper end and closed at the lower, has a flange or valve seat at its upper end, which is perforated by two small lateral openings. It also contains in its lower end a short centre post. The inner cylinder, which is made to move easily inside the outer one, is open at its lower end and closed at its upper. It has a flange or valve at its upper end, which fits evenly over the valve seat in the outer cylinder. A weight is in some instances made to press on this flange.

On the outside case is a Bunsen air burner with a spring valve, which, when pressed inwards, uncovers a small opening in the case.

Quicksilver is poured into the outer cylinder as high as the centre post, *i.e.*, one-third its height ; atmospheric air fills the other two-thirds. The inner cylinder, which is closed at the upper end, is then pressed into the outer one, and thereby encloses atmospheric air to the extent of two-thirds its capacity, the air being retained in position by the quicksilver.

The *modus operandi* may be thus described :—

Pressure on the spring valve allows a small quantity of gas to escape at the side opening in the brass tube. On lighting this gas at the Bunsen burner, it burns with a bluish flame, and heats the air in the inner cylinder ; the air expands, and in doing so, elevates the internal cylinder, thereby exposing the two openings in the shoulder of the outside cylinder. Gas then flows upwards through these openings, and escaping at the

op is lighted by the flame from the Bunsen burner. Pressure should then be removed from the spring valve. The whole operation does not last more than three or four seconds. When the light is blown out, the air in the inner cylinder cooling, contracts in volume, and lets the inner cylinder drop over the holes in the valve seat of the outer cylinder, thus preventing further escape of gas. Gas ceases to escape at the top in from two to three minutes.

Your Committee desire to express the opinion that the automatic cut-off gas-burner would be of great utility in preventing the fatal results which occasionally occur from the inhalation of any kind of illuminating gas.

All of which is respectfully submitted.

Toronto, May 20th, 1886.

J. J. CASSIDY.
FRANCIS RAE.

REPORT OF THE DELEGATE TO THE CANADIAN MEDICAL ASSOCIATION.

TORONTO, October 11th, 1886.

To the Chairman and Members of the Provincial Board of Health :

GENTLEMEN,—I have much pleasure in submitting a report of what was done in public health matters at the last annual meeting of the Canadian Medical Association, which took place in the city of Quebec.

The Association was convened in one of the lecture rooms of Laval University at 10 a.m., August 18th, the President, Dr. T. K. Holmes, of Chatham, in the chair, and Dr. James Bell, of Montreal, acting as Secretary. The other officers present were:—Dr. Charles Sheard, of Toronto, Treasurer; Dr. Sloan, of Blyth, Vice-President for Ontario, and Dr. Lehman, Local Secretary for New Brunswick.

In addition to the above the following members of the Association amongst others attended the meetings:—Dr. Russell, Quebec; Dr. Ahern, do.; Dr. J. E. Graham, Toronto; Dr. Chas. O'Reilly, do.; Dr. McFarlane, do.; Dr. Daniel Clark, do.; Dr. Carson, do.; Dr. Canniff, do.; Dr. Machell, do.; Dr. Theodore Covernton, do.; Dr. R. A. Reeve, do.; Dr. Cassidy, do.; Dr. Howard, Montreal; Dr. E. Desjardins, do.; Dr. Roger, do.; Dr. Shepherd, do.; Dr. Geo. Ross, do.; Dr. Fenwick, do.; Dr. Campbell, do.; Dr. Taschereau, do.; Dr. A. L. Smith, do.; Dr. LaChapelle, do.; Dr. Trenholme, do.; Hon. Dr. Sullivan, Kingston; Dr. Dupuis, do.; Dr. Kerr, Winnipeg; Dr. Jasken, do.; Dr. Eccles, London; Dr. Gardiner, do.; Dr. Jenner, Picton, Ont.; Dr. Gerald O'Reilly, Fergus; Dr. Macdonald, Wingham; Dr. Smith, Seaforth; Dr. Sherman, Ogdensburg; Dr. Carrier, Detroit; Dr. Latarte, do.; Dr. Imrie, do.; Dr. Foster, Portland; Dr. Playter, Ottawa; Dr. Broughton, New York. Mr. Boxer, Secretary of the Provincial Board of Health, Quebec, was also present during the meetings.

After routine business, a number of new members were elected and reports were called for, received and read upon the following subjects:—On Necrology, Education, Ethics, Publication, Practice of Medicine, Surgery, Obstetrics, Climatology and Public Health. After the report of the Committee on Obstetrics was read your delegate, in the absence of a report from the Committee on Public Health, laid before the meeting a letter from Dr. Yeomans, chairman of that committee, desiring Dr. Cassidy to discuss some portions of the supplementary quarantine regulations issued for the Dominion, August 3rd, 1886.

Your delegate expressed satisfaction with these regulations and offered the opinion that they were calculated to do great good in forwarding the health interests of the country, and if properly carried out were likely to give satisfaction not only to the Provinces of the Dominion, but also to the State Health Boards of the neighbouring republic. Referring to Section 4 of the supplementary quarantine regulations, which provides for cases

of cholera, he stated that he did not deem the precautions sufficient and offered the following substitute, viz.: "Should cholera break out on any ship, the quarantine officer should, beside the exercise of the precautions taken in the instance of smallpox and other infectious diseases, remove all passengers from the ship at Grosse Isle, detain them till the period of incubation from the date of the outbreak of the last case has elapsed, and also disinfect to his own satisfaction all their personal effects and luggage, as also the vessel and cargo, before allowing either the vessel, passengers or their luggage to proceed to port." (Vide Sec. C, page 18, Report on the Quarantine System of the St. Lawrence, approved and adopted by the Provincial Board of Health of Ontario, 1886).

Referring to the inspection of steamships and sailing vessels at Quebec (Sec. 10 of Regulations), your delegate suggested that the port physician should, prior to inspection, be requested to ask for clearance papers from Rimouski or Grosse Isle.

Section 19 provides that every master of a steam or sailing vessel shall be liable to a penalty not exceeding \$400, or to imprisonment until such penalty be paid for any contravention of the regulations, etc., etc.

Instead of \$400, your delegate suggested a much larger sum, and thought \$3,000 a proper amount, with imprisonment for the second offence.

Your delegate again referred in terms of praise to the generally excellent character of the quarantine regulations, and expressed the hope that the proper authorities might at some early day improve them by incorporating with them the amendments suggested above.

It was then moved by Dr. Eccles, of London, seconded by Dr. Daniel Clark, of Toronto, "That the Canadian Medical Association, at its annual meeting, convened at Quebec, views with pleasure the action taken by the Dominion Government, in the issue of the quarantine regulations, which have been put in force during the present month. We consider the prompt and thorough enforcement of the aforesaid regulations will be of incalculable benefit to the health interests of the country, and moreover it is our opinion that when 'intelligently applied' they are calculated to conserve the best interests of the trade and commerce of the Dominion."

At the general meeting on the second day, Dr. Canniff, Medical Health Officer, of Toronto, who had been absent, wished, by privilege, to say a few words upon the question of quarantine, which had been introduced by your delegate on the previous day. He stated that if infected persons pass through Quebec in a stage of incubation, from its position the city of Toronto would be specially exposed therefrom. He thought the resolution passed yesterday might go further and recommended to the Government the appointment of some medical man whose duty it should be to specially watch and keep track of all persons, who have been discharged from an infected vessel in quarantine. This would not involve a very large expenditure and might be the means of securing the safety of the Province of Ontario.

Dr. Fenwick, of Montreal, said that he had recently had a letter from the Minister of Agriculture, stating that no further appointment could possibly be made in the city of Montreal; that the Government considered that they had a sufficient establishment at Rimouski, at Grosse Isle, and at Quebec, and had determined against further increasing their staff. Dr. Fenwick himself did not think it necessary.

The discussion then dropped.

I may also mention that at the afternoon meeting on the first day, a paper was read by Dr. Playter, of Ottawa, "On the value of mortuary and other health statistics."

During the afternoon session on the second day of meeting, the following resolution by Dr. Playter was passed unanimously by the Association:—

"That the following be a special committee of this Association to consider the question of a system of vital statistics for the Dominion and to urge upon the Federal Government the advisability of making provision at an early day for obtaining full returns of births, marriages and deaths throughout the different provinces of the Dominion, namely: Hon. M. Sullivan, Kingston; Drs. F. H. Campbell and Larocque, of Montreal; Daniel Clark (P.L.A.) and Canniff, of Toronto; Ahern, of Quebec; and Grant and Playter, of Ottawa."

Nothing further of interest in Public Health matters transpired during the meetings.

Before the conclusion of the afternoon session on Thursday, votes of thanks were given to the authorities of Laval University for the use of the building, and to the railroad and steamboat companies for the courtesy shown by them to the Association.

The Association then adjourned.

Owing to valuable information obtained from various sources I may inform the Board, that if a system of quarantine inspection, efficient and yet not vexatious, is to be carried out at Grosse Isle, three things will be necessary. In the first place, a wharf, extending into deep water, will have to be constructed at the Grosse Isle quarantine station; in the second place the inspection of incoming ocean vessels, which do not carry the mails, equally with those which do carry them, will have to be made at whatever time in the twenty-four hours they arrive at the quarantine station; in the third place the inspecting staff at Grosse Isle will have to be doubled, one set of officials attending to the work of inspection between the hours of sunrise and sunset and another during the other hours of the day.

In the absence of any such convenience at present, the construction of a wharf extending into deep water at the Grosse Isle station is necessary, in order to enable ocean vessels to come alongside to be inspected, and subsequently subjected to whatever procedures the exigencies of the case and the quarantine regulations may call for, with the shortest possible detention.

If the inspection of *all* vessels were made as soon as they arrive at Grosse Isle, they would be enabled to proceed at once, if permitted, to the ports of Quebec or Montreal, and thus save many hours of valuable time which would otherwise be lost, while waiting for the visit of the inspecting officer, or while subsequently waiting for a favourable tide to enable them to overcome the difficulties of navigation in the St. Lawrence river, at Cap des Roches.

In explanation of this last observation I may say that vessels of large draught cannot pass Cap des Roches unless at high tide, and a detention of a few hours at Grosse Isle may compel them to wait for twenty-four hours or more in the stream in order to get a favourable tide.

In defence of the view here expressed it may be contended that the difficulties of navigation in the St. Lawrence, as compared with ocean ports, such as New York, seem to call for a special system of quarantine inspection if Canadian vessels are not to be put to a great disadvantage in the point of rapidity of transit, as compared with their American rivals.

If this plan should be favourably entertained by the Dominion Government, it would be necessary to double the inspecting staff at Grosse Isle.

The construction of a wharf and the increase of the staff at Grosse Isle need not necessarily entail a large expenditure; and if carried out they would certainly enable Canadian steamship companies to submit their vessels to a satisfactory quarantine inspection without interfering with that rapidity of transit from port to port, which is every day becoming a more marked feature of ocean travel.

All of which is respectfully submitted.

J. J. CASSIDY.

REPORT OF AN INVESTIGATION *re* NUISANCE FROM STARCH FACTORY, AT BRANTFORD.

To the Chairman and Members of Provincial Board of Health:

GENTLEMEN,—Having been communicated with by the Local Board of Health of Brantford township, and by the Medical Health Officer of Brantford, on several occasions regarding a nuisance arising from the starch factory, situated on the canal below the

city, and within the limits of the township, I made an inspection of the premises on July 2nd, and found the following condition of affairs :—

1. *The nature of the industry.* When running on full time the factory utilizes daily some 150 bushels of Indian corn, and forty or fifty bushels of rice, grinding them and extracting for commercial purposes their starchy products. Roughly, the process consists in softening the grain with water for a day or two while in a reservoir or hopper in the upper storey of the building. Then after grinding it, and allowing a watery solution of the ground grain to pass upon canvas cloth sieves, through which the starch and a certain amount of gluten are carried in suspension, the bran and other insoluble matters are carried over on the canvas sieves, and deposited in the refuse room.

The starch solution is then treated in large, shallow pans, lined with tinned or galvanized iron, with soda ley. By this treatment the starch is clarified to some extent, and is allowed to settle in the vats, remaining there some twenty-four hours or more. The supernatant alkaline liquid is then run off, and the starch is removed from the pans, and put into large vats where clean water is run in, and the starch stirred up and allowed to settle again; fresh water is added for several successive days, all albumenoid and other materials thereby being removed. The process is then completed, except the pressing, drying and packing.

From a bushel of corn some twenty-five pounds of ordinary corn starch are produced and proportionately of the rice.

2. *Ley-Products and Refuse.* It is readily seen, from the nature of the material used, that with a little care the manufacture of starch can be readily carried on without any nuisance; but should the prompt removal of the moist albumenoid materials be neglected, a source of serious nuisance may readily be created.

The husks of the grain, or its bran, are, as already said, carried over from the canvas screens to a refuse-room in a moist condition. This material has hitherto been disposed of to the dairymen, who haul it to their cow sheds in the surrounding country and suburbs, for feeding cows, the milk from which is largely sold in the city for household use. Should this moist food be regularly removed, and fed while fresh, little objection, I imagine, could be taken to its use; but bad weather, roads and other circumstances make its removal irregular, and in consequence putrefaction and fermentation of the nitrogenous and starchy materials is set up, producing smells of a most disagreeable character on the premises, and which too are given off from the decomposing materials while hauled along the roads. Dr. Griffin, Medical Health Officer, has prohibited entirely the use of this fermenting food for milch cows during the warm season.

The other and more widespread nuisance, arises from the supernatant alkaline liquors run off from the shallow vats in which the starch solution is treated. The glutinous portion of this liquor while in the vats, will often have undergone along with a certain amount of the starch water, a certain degree of fermentation; but the solution after being drawn off from the vats is run into a creek or old water-course, whose waters have been cut off by the canal, and during the present season, owing to there being no water for flushing this creek in consequence of the large dam at the head of the canal having been carried away by the spring floods, the alkaline refuse liquors trickle along the tortuous course of the creek for nearly three-quarters of a mile; the shallow water is rapidly evaporated and deposits its decomposing organic matter along the banks of the creek, creating in the neighborhood, and especially at the Mohawk Institute, through the grounds of which the creek runs, a nuisance of the most disagreeable and injurious character.

The remedies for this state of affairs are readily understood, and can very readily be carried into effect.

3. *Disposal of the Bran, and other By-Products of the Grinding.* What is required is its daily removal in warm weather or at a time before decomposition has begun in it, or better, the rapid drying out of the product and subsequent grinding as is being proposed by the firm. Should this latter method be introduced, the complete removal of the nuisance from this cause will result.

4. *Treatment of the Alkaline Waste Liquors.* The present condition of affairs cannot be tolerated, although the stoppage of the manufacture during the warm weather, as is being done to some extent, will help to lessen the difficulty.

When the water is again turned into the canal, frequent flushing of the creek, if the canal has sufficient water to spare, will likewise dilute the waste in its course to the Grand river.

A more thorough provision in the shape of a covered tile drain ought, however, to be made, by which the fluids could be rapidly and without local nuisance carried into the river.

Whether the question of alkaline pollution of the Grand river at this point has or is likely to become a serious matter as regards the fish, or its use by cattle of the farms farther down, is another question which might very properly be considered.

Respectfully submitted,

P. H. BRYCE,
Secretary.

SUMMARY OF MINUTES—PROCEEDINGS OF THE BOARD FOR 1886.

SPECIAL MEETING.

JANUARY 14th, 1886.

The Board met at 3 p. m., there being present :—

Dr. Covernton, Dr. Cassidy, Dr. Oldright and Dr. Bryce.

Communications were read re the necessity of appointing Medical Health Officers in various places, owing to the presence of, or danger from small-pox in them. It was thereafter moved by Dr. Oldright, seconded by Dr. Cassidy, and carried : That inasmuch as notice has been given to the Councils of the Village of Arnprior, and of the Townships of McNab, Admaston, Horton and Bagot, according to the terms of the Public Health Act, 1884, to appoint Medical Health Officers for their respective municipalities ; and inasmuch as notices of such appointment having been made, have not been received by this Board,—be it therefore resolved that the following gentlemen be recommended by the Board to the Lieutenant-Governor for appointment as Medical Health Officers.

Dr. O'Brien, (Renfrew village).....for Township of Bagot.

Dr. Mann, " " Townships of Admaston and Horton.

Dr. Cranston, (Arnprior village)..... " Township of McNab and Arnprior village.

The Board then adjourned.

CHAS. W. COVERNTON,
Chairman.

FIRST QUARTERLY MEETING.

(*First Session.*)

FEBRUARY 2nd, 1886.

The Board met at 2.30 p. m., there being present :—

Dr. Covernton, Chairman ; Dr. Cassidy, Dr. Yeomans, Dr. Rae, Dr. Oldright and Dr. Bryce.

The minutes of several previous meetings were read, and on motion of Dr. Bryce, seconded by Dr. Cassidy, were adopted.

Dr. Covernton read a brief paper summarizing work done at the Washington meeting of the American Public Health Association. He also referred to a communication from Mr. Boxer, regarding the matter of a Provincial Board to be formed in Quebec.

The following resolution was then carried, respecting the inspecting staff at Montreal.

Moved by Dr. Yeomans, seconded by Dr. Cassidy : That owing to the reports from Montreal and the Province of Quebec, received for the week ending January 30th, showing continued presence in that city and province of a considerable number of cases of smallpox, two inspectors be continued to do duty on the two railway lines running west from Montreal.

Professor Galbraith here took his seat at the Board.

Dr. Bryce read a communication from Dr. Stewart of Palmerston, transferred from the Department of the Attorney-General, *re* the supervision of his Vaccine Farm by the Board, and the extending to it the Board's patronage.

The following motion regarding the matter was then carried :—

“ Moved by Dr. Yeomans, seconded by Dr. Cassidy : That this Board having received notification from Dr. Stewart, of Palmerston, of the establishment by him of a Vaccine Farm, and that he has supplied medical men throughout the Province with samples of vaccine ; and, further, has asked continued inspection of his farm and methods of procedure ; therefore this Board recommend that the Government should provide for the continued, frequent and thorough inspection of this farm, or other farms that may hereafter be established, with the object of securing a supply of pure and reliable vaccine lymph, procurable within the Province ; and that a copy of this resolution be transmitted to the Attorney-General.”

C. W. COVERNTON,

Chairman.

(Second Session.)

FEBRUARY 3rd, 1886.

The Board met at 10.30 a. m., the following members being present :—

Dr. Covernton, Chairman ; Dr. Oldright, Dr. Cassidy, Dr. Yeomans, Dr. Rae, and Dr. Bryce.

The minutes of last meeting as amended were adopted, on motion of Dr. Cassidy, seconded by Dr. Rae : The printing account of the *Gazette* Printing Co., Montreal, for a circular *re* smallpox was certified to on motion of Dr. Rae, seconded by Dr. Cassidy : “ That the account of R. White, amounting to \$20 being one-half of the amount for printing joint report of Drs. Hingston and Covernton on epidemic of smallpox, be paid. Carried.

Dr. Hamilton, Cornwall, who was present, was introduced to the Board. He explained the nature and extent of his work in Cornwall as Medical Health Officer, acting under the Provincial Board.

Mr. Boyd, Police Magistrate, Vankleek Hill, being present, was likewise presented to the Board, and on request stated his views with regard to the present status of the Health Act, 1884, as regards the powers under it to abate nuisances. Amongst his views the following points seemed of importance :—

1st. As to composition of Local Boards, that in all cases when practicable, they be composed of medical men.

2nd. That in the event of not putting medical men on the Board, the appointing power to be resident in the County Council.

3rd. That as regards the term of office, if the Board be composed of laymen, the term ought to be three years, one-third of the Board retiring annually.

4th. That as to funds, the Council be required to supply them on a requisition passed by the Local Board of Health, the amount to be limited by the *per capita* basis of population.

5th. Do away with the \$2,000 clause, *re* Nuisances in Act of 1885.

6th. If *Certiorari* fails, on the conviction of the Police Magistrate, the nuisance as now may continue for two years.

Dr. Oldright afterwards, in a few remarks, thanked Mr. Boyd for his valuable hints.

Dr. Yeomans presented the report of the Special Committee on Cheese Factories. The report after being read, and some discussion on it having taken place, was received and adopted, on motion of Dr. Yeomans, seconded by Dr. Bryce. Mr. J. Robertson, of the Committee of the Dairymen's Association, being present, was introduced to the Board, and asked to present his views and those of his Committee. Mr Robertson read the report of his Committee, and answered a large number of queries put by members of the Board. Further consideration of the matter being desirable, the Board adjourned the discussion till 2.30 p. m.

C. W. COVERNTON,
Chairman.

(Third Session.)

FEBRUARY 3rd, 1886.

The Board met at 2.30 p. m., all the members being present.

The reading of the minutes having been omitted, the discussion of the special report on Cheese Factories was continued.

Mr. Robertson in reply to queries, spoke regarding the possibilities and desirability of having inspections of dairies carried on. He thought it would be desirable to have examinations of milk supplies made. The report on Cheese Factories was then adopted, on motion of Dr. Yeomans, seconded by Dr. Bryce: The following motion was then carried:—

“Moved by Dr. Yeomans, seconded by Dr. Rae: That in consideration of the very great interest manifested by Mr. Robertson, of Harriston, in the matter of sanitary improvement of Cheese Factories, Creameries and Milk Supplies, this Board tenders him a cordial and hearty vote of thanks for his valuable services and suggestions.”

It was then moved by Dr. Bryce, seconded by Dr. Yeomans: That the partial report of the Committee on Legislation as read be received, and that the Board go into Committee of the Whole to consider it. Carried.

The Committee of the Whole, after discussion of its provisions, read and reported the prepared Bill to Expropriate Land for Smallpox Hospital purposes as amended, which was adopted, on motion of Dr. Rae, seconded by Dr. Cassidy.

The same Committee presented the following amendments to sec. 19, Act of 1884, and sec. 3, Act of 1885, which, on motion of Dr. Rae, seconded by Dr. Yeomans, was adopted.

Amendment to Sec. 19, Act of 1884:—

“Such appointment, subject to the approval of the Board, may be made by the Chairman of the Provincial Board.

Amendment to Sec. 3, Act of 1885:—

“Such appointments, subject to the approval of the Board, may be recommended by the Chairman of the Provincial Board of Health.”

Dr. Covernton, after the Committee had reported, and these amendments to legislation had been adopted, discussed at some length the prospects for the next American Public Health Association, and explained the work of Members of that Association belong-

ing to this Board, making arrangements thus for the coming meeting in Toronto. The following resolution, moved by Dr. Oldright, seconded by Dr. Yeomans, was carried :—

“That Drs. Covernton, Cassidy, Prof. Galbraith, Dr. Bryce and the mover, be a Committee of the Board to act in concert with the Committee appointed by the American Public Health Association, with the City Council, the Canada, Ontario and Toronto Medical Associations, Sanitary Associations and Canadian Institute, and representatives of any other bodies, in making arrangements for the meeting of the American Public Health Association to be held in Toronto in October; and that this Committee wait upon the Government with regard to an appropriation to meet the expenses connected therewith.”

The following motion was carried :—

Moved by Dr. Rae, seconded by Dr. Cassidy : That the Special Committee *re* Cheese Factories and Creameries be instructed to take such action in conjunction with the Committee on Legislation—and the Committee of the Western Dairymen's Association, as will place Municipal Authorities in a position to provide, by a suitable system of inspection, for the purity of their milk supplies, and to report to this Board at its next meeting.

The Board then adjourned.

C. W. COVERNTON,
Chairman.

(*Fourth Session.*)

FEBRUARY 4th, 1886.

The Board met at 11 a. m., all being present except Prof. Galbraith.

The reading of the minutes of previous meetings having been deferred, the Board resolved itself into a Committee of the Whole on the Vaccination Bill, Dr. Rae being in the chair.

The Board arose and reported progress, and adjourned till 2.30 p. m.

(*Fifth Session.*)

FEBRUARY 4th, 1886.

The Board met at 2.30 p. m., all the members being present.

The Board, in Committee of the Whole, resumed the consideration of the Bill *re* Vaccination.

The Committee thereafter arose and reported the Bill as amended; and on motion of Dr. Rae, seconded by Dr. Covernton, the Report of the Committee of the Whole was adopted.

Dr. Cassidy thereafter presented a summarized report of answers to questions contained in a circular sent by the Committee on Publication, according to the terms of a Notice passed at a preceding meeting.

It was then moved by Dr. Rae, seconded by Dr. Bryce and carried: “That the tabulated results contained in the circular dated November 23rd, 1885, be referred back to the Committee with instructions to draw up such conclusions therefrom, and to make such recommendations to the Minister regarding them, as the Committee may deem expedient.”

“Dr. Rae then moved, seconded by Dr. Cassidy: “That a sum not exceeding \$40 (say forty dollars), be placed in the hands of the Chairman for the purchase of such of the recent sanitary publications, as may appear necessary for the work and purposes of the Board.” Carried.

The Board thereafter resolved itself into a Committee of the Whole on the Plumbing Bill, and after some consideration arose and reported progress.

The Board then adjourned till next morning at 10.30 o'clock.

(Sixth Session.)

FEBRUARY 5th, 1886.

The Board met at 11 a. m., all the members being present except Prof. Galbraith.

The minutes of the last meeting were read and adopted on motion of Dr. Rae, seconded by Dr. Bryce.

No communications having been received, the Board resolved itself into a Committee of the Whole on the Plumbing Bill.

The Committee arose and reported progress, and the Board adjourned till 3 p. m.

CHAS. W. COVERNTON,
Chairman.

(Seventh Session.)

FEBRUARY 5th, 1886.

The Board met at 3 p. m., all the members being present.

The minutes of the last meeting having been omitted, the Board resolved itself into a Committee of the Whole, finally arose and reported the Plumbing Bill as amended.

On motion of Dr. Rae, seconded by Dr. Oldright: The resolution to adopt the Bill as amended to form Schedule C to Public Health Act, 1884, was carried.

It was then moved by Prof. Galbraith, seconded by Dr. Yeomans: That the various bills and items of proposed legislation be placed in the hands of a Committee, consisting of the Committee on Legislation and Drs. Oldright and Rae, to be brought before the attention of the Government at such time as they may deem most opportune. Carried.

The report of a Committee of the Board appointed to prepare a work on Hygiene for the use of Schools, was presented by Dr. Oldright, after which the following motion was passed:—

Moved by Dr. Oldright, seconded by Prof. Galbraith: "That the Manual of Hygiene for use in the Normal and Model Schools, appended to the report of the Committee appointed to prepare the same, be, and is hereby adopted by this Board, subject to such textual changes as may be needed in the unrevised galleys of Chaps. XVI-XXXI."

The report of the Committee on Publication was presented by Dr. Oldright, who stated the plan which the Committee thought desirable for the next Annual Report of the Board. The report was adopted on motion of Dr. Oldright, seconded by Dr. Yeomans.

The Board finally adjourned to meet again at the call of the Chair.

CHAS. W. COVERNTON,
Chairman.

SPECIAL MEETING OF THE BOARD.

APRIL 21st, 1886.

A special meeting of the Board was called, at which there were present: Dr. Covernton, Dr. Cassidy, Dr. Oldright and Dr. Bryce.

It was moved by Dr. Bryce, seconded by Dr. Cassidy: "That the minutes of the last meeting be omitted." Carried.

The Chairman stated the occasion for calling a Special Meeting, and called upon Dr. Bryce to read a special report on the "Toronto Cattle Market Question."

The report having been read was unanimously adopted and amended, on motion of Dr. Bryce, seconded by Dr. Cassidy. The report was by resolution, ordered to be transcribed and a copy of it sent to the Mayor and Council of the Corporation of the City of Toronto.

The meeting then adjourned.

CHAS. W. COVERNTON,
Chairman.

SECOND ANNUAL QUARTERLY MEETING.

(First Session.)

MAY 18th, 1886.

The Board met at 2.30 p.m., all the members being present.

The Secretary read the minutes of the two last meetings, which, on motion, were confirmed.

A number of communications, both written and verbal, were presented to the Board by various members. Dr. Cassidy then made some remarks regarding an invention which Dr. Henderson, of Winnipeg, wished to exhibit to the Board. The Board agreed to hear Dr. Henderson on Wednesday morning, at 11 o'clock.

The Chairman then proceeded to read his annual address.

After the reception of the address, Dr. Cassidy discussed the paragraph of the report referring to the inspection of the drains and plumbing of buildings, and urged that the regular inspection of all works under municipal control, whether public or private, be better carried out; illustrating, however, the difficulties by the necessity forced upon the License Commissioners of withholding a hotel license in several instances, until urgent sanitary improvements had been performed on the premises.

Dr. Yeomans further emphasized this necessity by pointing out that it was needed in rural municipalities, and urged that Provincial inspection be instituted on some regular basis, and that in particular a number of schools in different parts of the Province be visited and inspected.

Dr. Oldright made some remarks pointing out the necessity of having the western cattle market so situated that no injury from its unsanitary state would result, and that it should be subjected regularly to an inspection, owing to the rapid development of the city in an easterly direction. He also alluded to the east end cattle byre nuisance.

Professor Galbraith, in urging inspection, insisted that the chief officer of any public work ought always to have control of his subordinates, and of their dismissal if insubordinate or incompetent.

Dr. Rae, while concurring in the remarks of gentlemen who had previously spoken regarding inspection, referred to the difficulties of having stringently carried out the Public Health laws by boards, inspectors, etc., through fear of popular resentment.

It was then moved by Dr. Rae, seconded by Dr. Yeomans: "That the Chairman's Annual Address be adopted and printed in the next Annual Report."

Dr. Covernton gave verbally what had been done in connection with the various matters relating to the American Public Health Association; and Dr. Yeomans read a communication from Mr. Robertson, of the Dairymen's Association, explaining why the pamphlet, directed by resolution of the Board to be prepared, had been delayed,

In this connection the following resolution was carried:—

Moved by Dr. Cassidy, seconded by Dr. Rae: "That having heard the partial report of the Committee *re* Cheese Factories, this Board recommends that said Committee continue to co-operate with Mr. Robertson and the Committee of the Dairymen's Association; and, also, that they report more fully at next meeting of the Board."

A communication from Dr. Clapp, Esq., Public School Inspector of Wellington, *re* School-house in Maryboro', was read. It was referred to the Committee on School Hygiene to take action thereon, if deemed desirable.

Dr. Bryce presented a large number of other communications, *re* matters dealt with during the past quarter, after which the Board adjourned.

CHARLES W. COVERNTON,
Chairman.

(Second Session.)

MAY 19th, 1886.

The Board met at 10.30 a.m., all the members being present. The Secretary read the minutes of the last session, which were, on motion, confirmed.

Dr. Henderson was then introduced to the Board, and explained his Automatic Cut-off Gas-Burner, intended to obviate the dangers due to the escaping of illuminating gas. In connection with this matter the following motion was carried:—

Moved by Professor Galbraith, seconded by Dr. Oldright, and carried: "That the matter of Henderson's "Automatic Cut-off Gas Burner," for the prevention of accidents due to the escape of illuminating gas, be referred to the Committee on Ventilation and Poisons, to be reported upon during the present Session."

The Committee on Legislation presented a verbal report regarding the success of the various items of proposed legislation urged upon the Legislature at its last session. The report was adopted, and the Board adjourned to meet at 2.30 p.m.

CHARLES W. COVERNTON,
Chairman.

(Third Session.)

MAY 19th, 1886.

The Board met at 2.30 p.m., all the members being present.

The minutes of the last session were read and adopted.

The following motion was then carried in connection with the Report of the Committee on Legislation:—"That the Committee on Legislation be, and is hereby requested to prepare a paper embodying all regulations now in force regarding Vaccination, with the object of having it published for distribution.

Dr. Bryce then read his report on the inspection made of the Ontario Vaccine Farm, at Palmerston. The report was received, and various points in it discussed, after which the following resolution was adopted:—

Moved by Dr. Oldright, seconded by Dr. Yeomans: "That the report of the Secretary on the Vaccine Farm, at Palmerston, be received and adopted, and that the Secretary be instructed to carry out the suggestions contained in the report."

A discussion then took place on a proposition introduced by the Secretary, that an endeavour be made to have an Ontario Association of Medical Health Officers formed. In connection therewith it was moved by Dr. Yeomans, and seconded by Dr. Bryce: "That a Committee consisting of Drs. Oldright, Yeomans and Bryce be appointed to prepare a scheme to be submitted to the Board at its next meeting, for the organization of an Association of Medical and other Officers of Health for the Province of Ontario." Carried.

It was thereafter moved by Dr. Oldright, and seconded by Dr. Yeomans: "That the Board go into Committee of the Whole to consider the appointment of Standing Committees for the year." Dr. Oldright in the chair.

After discussion the Committee arose and reported the following list of members of Committees, which report, on motion of Dr. Oldright, seconded by Dr. Cassidy, was received and adopted.

List of Standing Committees for 1886:—

1. Committee on Epidemics—Chairman and Secretary.
2. " " Sewerage, etc.—Dr. Oldright and Professor Galbraith.
3. " " Ventilation, etc.—Dr. Cassidy and Dr. Yeomans.
4. " " Poisons, etc.—Dr. Rae and Dr. Cassidy.
5. " " School Hygiene—Drs. Yeomans and Covernton.

6. Committee on Legislation—Dr. Bryce and Dr. Cassidy.
7. " " Finance—Chairman and Dr. Rae.
8. " " Publication—Drs. Oldright, Cassidy and Bryce.
9. " " Foods, Drinks, etc.—Drs. Bryce and Rae.

The annual report of the Secretary to the Board was received, on motion of Professor Galbraith, seconded by Dr. Oldright.

Dr. Oldright then presented the report of the Committee appointed by the Chairman to attend the Sanitary Convention at Woodstock, on March 30 and 31. It was adopted on motion of Dr. Oldright, seconded by Dr. Bryce.

The Board adjourned till 10.30 a.m.

CHARLES W. COVERNTON,
Chairman.

(*Fourth Session.*)

MAY 20th, 1886.

The Board met at 11.30 a.m., all the members being present.

The minutes of the previous meeting were read and adopted. Dr. Oldright here stated that the Committee on Sewerage was not prepared to report, owing to there being a difficulty in arriving at a conclusion regarding various points in the proposed system of sewerage for Stratford and Owen Sound.

It was then moved by Dr. Rae, seconded by Dr. Bryce: "That the Committee on Sewerage be authorized to take such steps as will place them in possession of all facts necessary to the preparation of said report, and that the Committee present such report to the Board at the earliest possible date." Carried.

It was then moved by Dr. Oldright, seconded by Dr. Cassidy: "That the letter of Dr. Ryall be referred to the Committee on Foods and Drinks, with instructions to report during present meeting if possible, and to take whatever steps may appear necessary to secure purity of ice supplies." Carried.

Dr. Rae moved, seconded by Dr. Oldright: "That the minutes of the last session be reconsidered, and that the Board go into Committee of the Whole to consider its report *re* Standing Committees."

The motion was adopted, and the amended report of the Committee of the Whole on Standing Committees adopted as amended, Dr. Cassidy being added to the Committee on Poisons.

Moved by Dr. Yeomans, seconded by Dr. Cassidy: "That inasmuch as Dr. Stewart, of Palmerston, has fulfilled some of the conditions required by the Board for the supply of reliable vaccine for this Province, this Board would recommend the payment of \$250 out of the Government grant; also, that the remainder be paid in quarterly instalments, Dr. Stewart continuing to fulfil the conditions laid down by this Board." Carried.

Dr. Rae then presented the report of the Committee on Poisons, supplemented by a partial report by Dr. Cassidy. Before discussing the report, Dr. G. W. Ross, of Woodstock, was introduced to the Board, and stated some difficulties regarding the disposal of sewage matter in the main sewers of the town, and asked the Board's opinion on the matter. The matter was discussed, and legal remedies for the difficulties pointed out.

The report of the Committee on Poisons and Ventilation was again taken up, when Dr. Bryce moved the reception of the report, seconded by Dr. Rae, and that the discussion of it be adjourned till the special meeting of the Board. Carried.

Moved by Dr. Cassidy, seconded by Dr. Oldright: "That the Board is of opinion that it is most desirable that automatic cut-off gas-burners should be in more general use, and having examined the one presented to the Board by Dr. Henderson, we are of opinion that it is likely to be of great service in preventing fatal accidents from the use of illuminating gas." Carried.

The Board then adjourned to the call of the Chair.

CHARLES W. COVERNTON,
Chairman.

SPECIAL MEETING.

(First Session.)

MAY 31st, 1886.

The Board met at two p.m., there being present Dr. Covernton, Dr. Rae, Dr. Cassidy, Dr. Oldright and Prof. Galbraith.

In the absence of the Secretary, Dr. Rae acted as Secretary *pro tem*. The minutes were read, and with an amendment *re* Dr. Oldright's remarks, adopted.

Communications were read from Dr. F. Orme Dudfield, Vice-President of the Association of Health Officers of England and Wales; also from Dr. Saunders, Hon.-Secretary of the same Association. Several other communications were read.

Professor Galbraith presented a report on the proposed system of sewerage for the city of Stratford, recommending some changes in the proposed plan; and also presented a partial report on the proposed system of sewerage for Owen Sound.

Dr. Oldright then moved, seconded by Dr. Cassidy: "That the Board, having already expressed its opinion regarding the site of the Toronto Cattle Market, from a sanitary point of view, it is not desirable to take any further action or discuss the question further until the motion for an injunction now before the Courts is disposed of." Carried.

The following motion was then passed, *re* the Symington system of upward filtration of sewage:—

Moved by Dr. Cassidy, seconded by Professor Galbraith: "That the system of purifying sewage by upward filtration, as exhibited to this Board by the late Mr. Symington, be referred to the Committee on the Disposal of Sewage, with the request that they investigate the same and report at our next quarterly meeting; and that the Committee are hereby authorized to incur any expense which may be necessary in carrying out the proposal."

Dr. Rae submitted the report on Foods, Drinks, etc., regarding the question of ice supplies; and on motion of Dr. Cassidy, seconded by Dr. Rae, the report as read was adopted. The Committee on Legislation was instructed to procure legislation *re* ice supplies.

A discussion then took place on the report by Dr. Cassidy, *re* an automatic cut-off Burner. The report was adopted as amended.

The Board then adjourned to the call of the Chair.

H. P. YEOMANS,

Chairman, *pro tem*.

SPECIAL REGULAR MEETING.

(First Session.)

JULY 20th, 1886.

The Board met at two p.m., the following members being present:—Dr. Oldright, Dr. Rae, Dr. Cassidy, Dr. Yeomans, Prof. Galbraith and Dr. Bryce.

In the absence of Dr. Covernton, Dr. Yeomans was appointed chairman *pro tem*. The minutes of the last special meeting were read and confirmed.

A large number of communications were read, most of them being with regard to smallpox cases in the vicinity of Owen Sound. A communication *re* the means of limiting nuisances arising in connection with cheese factories, was received and read, from Mr. J. Robertson, Creamery Department, Agricultural College, Guelph. Communications from Cotswold, Moira, Vittoria, etc., were read. Dr. Bryce then presented a report on the quarantine system of the St. Lawrence, from the Committee on Epidemics. The reading of the report was proceeded with till 6 p.m., when the Board adjourned till 10.30 a.m., Wednesday.

(Second Session.)

WEDNESDAY, JULY 21st, 1886.

The Board met at 10.30 a.m., the following members being present :—Dr. Yeomans, Chairman *pro tem.*, Dr. Rae, Dr. Cassidy Dr. Oldright and Dr. Bryce. The minutes of the last meeting were read and confirmed.

A number of communications were read, the principal being regarding smallpox, from Dr. H. B. Baker, Lansing, Michigan, and Acton C. Burrows, Deputy-Minister of Agriculture, Winnipeg.

The reading of the report of the Committee on Epidemics was resumed, and its consideration continued, after which it was adopted, in accordance with the following resolution :—

Moved by Dr. Bryce, seconded by Dr. Oldright: "That the report of the Committee on Epidemics regarding the Quarantine System of the St. Lawrence be received and adopted, and that the Publication Committee be authorized to have 1,500 copies of it printed in pamphlet form."

A report was thereafter presented and read by the Secretary, *re* an investigation of the nuisance arising from the Starch Manufactory, at Brantford, after which it was adopted.

A verbal report was made by the Secretary, of a visit made to Lindsay by him, *re* certain nuisances and unsanitary conditions arising from sewers, etc., and regarding the the causes of the prevalence of diphtheria in the town. The report was adopted, after which the Board adjourned.

H. P. YEOMANS,

Chairman, *pro tem.**(Third Session.)*

JULY 21st, 1886.

The Board met at three p.m., there being present Dr. Yeoman's, Chairman; Dr. Rae, Dr. Bryce, Dr. Oldright and Dr. Cassidy. The minutes of the last meeting were, on motion, confirmed.

The report of the Committee on Sewerage *re* the plans presented to the Board regarding the sewerage system of Owen Sound and Stratford, was read and adopted, on motion of Dr. Bryce, seconded by Dr. Rae.

It was thereafter moved by Dr. Bryce, seconded by Dr. Cassidy, and carried: "That the report of the Committee on Legislation, in which was presented an abstract of the laws relating to Vaccination, be adopted; and that 3,000 copies of the abstract be printed in pamphlet form."

It was then moved by Dr. Cassidy, seconded by Dr. Rae: "That 2,000 copies of the Acts of 1884-5-6 be struck off in pamphlet form for distribution to Boards.

Moved by Dr. Oldright, seconded by Dr. Cassidy, and carried: "That the Board hereby recommend that the travelling expenses of the Secretary in visiting the quarantine station of the St. Lawrence, be paid out of the funds of the Board."

It was then moved by Dr. Oldright, seconded by Dr. Yeomans: "That the Committee on Epidemics be instructed to revise pamphlet No. 15 on Contagious Diseases, and send the same to the Publication Committee, which is hereby authorized to have 5,000 copies printed.

It was next moved by Dr. Oldright, seconded by Dr. Rae: "That a copy of the report on the Quarantine System of the St. Lawrence be transmitted to the Head of the Department, with the request that he take the necessary steps to have the facts and suggestions contained therein laid before the Federal authorities, in response to the invitation

contained in the letter of the Hon. J. C. Pope, Minister of Agriculture, addressed to the Honourable the Provincial Treasurer and Commissioner of Agriculture and Health, dated April 8th, 1885.

Dr. Bryce, as Chairman of the Committee on Foods, then read a report on the Slaughter-house and Abattoir question. He referred to the agitation now being made by some of the butchers of Toronto to have Sections 8 and 9, Schedule A, Public Health Act, 1884, repealed; and answered the arguments and objections urged by them. He also pointed out the advantages accruing to the public and the retail butchers, to be derived from the establishment of a public abattoir, and further drew attention to the fact that in many parts of the city, slaughter-houses are now causing much annoyance to persons residing in their vicinity. Finally, he referred to the diseases caused by eating unsound meat, and to the urgent necessity there is for live meat inspection which, under present arrangement does not exist and cannot be efficiently carried on.

The report was received and adopted, and the opinion expressed in the report regarding the undesirability of any action being taken by the Toronto City Council, tending to alter the stringent conditions of Schedule A, Public Health Act, 1884, as relating to slaughter-houses, was unanimously re-asserted by the Board.

Dr. Rae then moved, seconded by Dr. Oldright: "That Dr. Cassidy be appointed a delegate from this Board to represent the public health interests of the Province in the discussions regarding quarantine and other public health matters, at the meeting of the Canada Medical Association, to be held in Quebec on the 18th of August next." Carried.

The Board then adjourned.

H. P. YEOMANS,

Chairman, *pro tem.*

SPECIAL MEETING OF THE BOARD.

OCTOBER 4th, 1886.

The Board met at 8 p.m., there being present Dr. Covernton (chairman), Dr. Oldright, Dr. Cassidy, Professor Galbraith, Dr. Rae and Dr. Bryce.

The Committee on Sewerage and Water Supply submitted the report on the Trunk Sewer scheme for the city of Toronto, which, in accordance with Sec. 38, Public Health Act, 1884, requires to be submitted to this Board for its approval.

The report of the Committee, after a very careful discussion, was adopted.

The Board then adjourned.

CHAS. W. COVERNTON,

Chairman.

FOURTH REGULAR MEETING OF THE BOARD.

(*First Session.*)

OCTOBER 11th, 1886.

The Board met at 11 a.m., there being present Dr. Covernton, Dr. Oldright, Dr. Cassidy, Dr. Rae, Dr. Yeomans and Dr. Bryce.

A number of communications giving information regarding recent outbreaks of Diphtheria were read from St. Marys, Hawkesbury East township, Cherry Valley, Fenelon Falls, Ancaster and Lindsay.

The Board adjourned at 1 p.m.

(Second Session.)

The Board met again at 3 p.m., there being present all the members present at last session.

Further communications were read, being those from Harriston, regarding a nuisance existing there; from Windsor and Chatham, regarding smallpox; from Middlesex, Lanark county, regarding a mail-carrier whose family has Scarlet Fever; from Napanee regarding Diphtheria, and one from Annan regarding compensation for medical services *re* Smallpox at Leith.

Dr. Covernton thereafter confirmed the minutes of the special meeting of October 4th, in connection with which meeting, and the report thereat presented, the following motion was carried:—Moved by Dr. Cassidy, seconded by Dr. Yeomans: "That the report of the Committee on the Disposal of Sewage *re* the contemplated system of sewerage prepared for the city of Toronto, adopted at the last meeting, be printed in the next Annual Report."

Dr. Covernton then made a verbal report on the Hampstead Temperance Hospital, the London Ambulance System of Hospitals for Infectious Diseases; and also of the conclusion of Dr. Shakespeare, Pennsylvania University, *re* the Continental experiments on the nature of Cholera.

It was then adopted on motion of Dr. Bryce, seconded by Dr. Oldright.

Dr. J. J. Cassidy next read a report on the discussions relating to quarantine, and other matters of public health interest, at the meeting of the Dominion Medical Association at Quebec.

The report as read was received and adopted, on motion of Dr. Bryce, seconded by Dr. Yeomans.

(Third Session.)

OCTOBER 12th, 1886.

The Board met at 11 a.m., there being present: Dr. Covernton, Dr. Oldright, Dr. Bryce, Dr. Cassidy, Dr. Yeomans and Dr. Rae.

A communication was read from Dr. McLellan, Trenton, *re* Smallpox; and the action taken by the Board *re* the outbreak was indicated.

The Board, on motion of Dr. Bryce, seconded by Dr. Rae, went into Committee of the Whole *re* Regulations for limiting Diphtheria. The Committee arose at 1 p.m. and reported progress.

The Board then adjourned till 3 p.m.

(Fourth Session.)

OCTOBER 12th, 1886.

The Board resumed work at 3 p.m., there being present: Dr. Covernton, Dr. Oldright, Dr. Rae, Dr. Yeomans and Dr. Bryce.

The Board again resolved itself into Committee of the Whole to discuss the Diphtheria Regulations.

The Committee arose and reported progress, and adjourned at 6 p.m., to meet on Wednesday at 11 a.m.

(Fifth Session.)

OCTOBER 13th, 1886.

The Board met at 11 a.m., there being present: Dr. Covernton, Dr. Oldright, Dr. Cassidy, Dr. Yeomans, Dr. Rae and Dr. Bryce.

The Board resumed work in Committee of the Whole, on the Diphtheria Regulations. After consideration the Committee arose and reported the Regulations to the Board.

Dr. Cassidy, acting Chairman in the absence of Dr. Covernton, being in the chair, the Regulations *re* Diphtheria were adopted on motion of Dr. Bryce, seconded by Dr. Rae.

Dr. Oldright then moved, seconded by Dr. Rae: "That the Committee on Legislation be directed to bring the Regulations *re* Diphtheria before the Minister for approval of the Lieutenant-Governor."—Carried.

It was then moved by Dr. Oldright, seconded by Dr. Rae: "That the report of the Committee on Publication, *re* the Rules for Checking the Spread of Contagious and Infectious Diseases be adopted."—Carried.

Dr. Oldright then moved, seconded by Dr. Rae: "That the report of the Committee on the proposed water supply system for Cornwall be adopted."—Carried.

Dr. Oldright stated for the information of the Board, that after the decision of the people *re* the Toronto Trunk Sewer question, he had shown Col. Waring and other prominent sanitarians over the island and the location of the proposed sewage outfall; and also added some additional information regarding lake currents, etc.

It was thereafter moved by Dr. Rae, seconded by Dr. Yeomans, and carried: "That the Committee on Publication be directed to proceed to the selection and preparation of the materials for the next Annual Report, to be submitted for approval to the Board at its next meeting."

The Board finally adjourned at 2 p.m.

CHAS. W. COVERNTON,

Chairman.

SPECIAL GENERAL MEETING.

(*First Session.*)

WEDNESDAY, December 15th, 1886.

The Board met at 2.30 p.m., there being present: Dr. Covernton, Chairman; Dr. Oldright, Dr. Cassidy, Prof. J. Galbraith and Dr. Bryce.

The minutes having been read and confirmed, the Secretary read a number of communications regarding Smallpox in Hinchinbrook township and at Trenton; and Diphtheria in Lindsay, Beachville, Glamorgan township, Brantford, etc., etc.; as well as a communication from Vittoria indicating the action taken in connection with a nuisance arising from a cheese factory and piggery connected therewith.

Answers from a large number of States were read, indicating their adhesion to a common plan of inter-state notification of disease.

The Report of the Standing Committee on Sewerage and Water Supply was then presented, and dealt with a proposed sewerage system for a part of St. Catharines, as also a proposed system for Brockville.

The report was adopted on motion of Dr. Oldright, seconded by Prof. Galbraith.

Several accounts were presented and passed.

It was then moved by Dr. Oldright, seconded by Prof. Galbraith: "That copies of Dr. Cassidy's report, in which he discussed the means to be adopted for diminishing the amount of mortality amongst foundlings, be sent to the Head of the Department, to the Attorney-General, and to the President and Secretary of the Committee which recently waited on the members of the Government in connection with the subject."

Dr. Oldright thereafter moved, seconded by Dr. Bryce: "That the communication of Coroner Duncan, regarding the means to be adopted with a view to lessen the mortality from the ignorant use of illuminating gas, be referred to the Committee on Poisons and Accidents, with instructions to report at the next meeting of the Board."

The Board then adjourned.

(Second Session.)

THURSDAY, December 16th, 1886.

The Board met at 11 a.m., there being present: Dr. Covernton, Chairman; Dr. Cassidy, Dr. Oldright and Dr. Bryce.

Communications having been read and received, the Secretary presented the report on his inspection of the Ontario Vaccine Farm, Palmerston; which, on motion, was adopted.

The report of the Committee on Publication was read and adopted as amended, on motion of Dr. Oldright, seconded by Dr. Bryce. Mr. Alan Macdougall being invited to a seat at the Board, as Secretary of the Toronto Sanitary Association, made a statement in which the favourable progress of the proposed plumbing by-law for Toronto, before the Local Board of Health and the City Council, was indicated. The Chairman thanked the gentleman for his remarks.

It was then moved by Dr. Bryce, seconded by Dr. Cassidy: "That Drs. Oldright and Rae be appointed a Committee, in addition to the members of the Committee on Legislation, to revise existing Health Acts and secure amendments thereto, while in process of consolidation."—Carried.

The Board then adjourned.

CHAS. W. COVERNTON,
Chairman..

ANNUAL REPORTS

OF

LOCAL BOARDS OF HEALTH.

In the following pages will be found an extended summary of all the reports of Local Boards throughout the Province, received up to the time of the preparation of the Annual Report. Many other reports have since been received, but unfortunately too late for publication. It is hoped, however, that those appended will serve to fully illustrate the progress, development and present condition of municipal health work throughout the Province.

In many of the reports of our large cities and towns, gratifying evidences of the advance of practical sanitation are given; and there can be no doubt but that, with the yearly increased systematizing of work naturally falling to the health departments, we shall see sewerage systems, public water-supplies, etc., increasingly established on broad, scientific and safe sanitary foundations.

ANNUAL REPORTS OF LOCAL BOARDS OF HEALTH.

CITIES.

BELLEVILLE.

Medical Health Officer's Report.

As Medical Health Officer of the city for the year 1886, I have the honour to report as follows:—

1. At the request of the Board I had the order issued for the cleaning of yards and emptying and disinfecting of water-closets, which was only fairly responded to. I made a personal inspection of the yards on Front street and found the greater number cleaned, and those who had not done so I had served with notices through the police, directing them to do so at once, which was effective. The Inspector has brought to my notice some seventy-eight cases of water-closets and yards which required cleaning and disinfecting. I served the necessary order, after, in a great many instances, going myself and seeing the nuisance complained of. I would hereby draw the attention of the public to the necessity, in writing to me, of signing their names to the letter of complaint, not necessarily for publication, but simply for my own guidance and to satisfy me that the complaint is genuine. I have received a number of anonymous complaints on which I could not act, the complaints in a great many instances originating in neighbours quarrelling amongst themselves and trying to make me their cat's-paw and do their dirty work.

2. I would again draw the attention of the Council to allowing the keeping of pigs within the corporation during the summer months: no matter how clean the styes may be kept, it is impossible to do away with the stench from them. I have had some complaints from this source. I would also draw the attention of the Council to the slaughter-houses, and soap and tallow rendering places of manufacture, complaints having been made of these places, but owing to the Council not giving the Board power under the Act as passed by the Ontario Government, the Board's hands were to a certain extent tied.

3. In connection with the health of the city, the Board would suggest that a survey of the city be made for a system of drainage, so that drains made should be made as part of that system, more especially as the city is to have water-works; drainage will then be an absolute necessity.

4. The city for the past year has been very healthy, our death rate being amongst the lowest for the Dominion. Still it does not do for us to rest. A proper system of drainage and good water will make our city the healthiest city in Ontario.

5. The number of yards ordered to be cleaned was 78; water-closets emptied and disinfected 175; other nuisances, such as manure heaps, dead horses and dogs, removed, 49.

6. Complaints having been made in the press of the unsanitary state of the police cells, and the Council having decided to remove them from the city buildings, I suggested to the Market Committee to meet the Board of Health and inspect the building. I drew the attention of the Market Committee to the drain leading from the building into the sewer, and showed them that the building was simply a shaft for ventilating the sewer. I suggested that a proper trap-drain be put in and larger and straighter pipes put in the cells, and that if this was done I had no doubt the nuisance would be abated, and it would be seen that it was the sewer and not the cells that caused it. This could be done

by an expenditure of about \$100, thus saving to the city the cost of erecting a new building at a cost of \$2,000 or \$3,000. The Market Committee agreed with me, and the drain was trapped and the pipes put into the cells as suggested, with a result satisfactory. There has been no complaints since, in fact the building is now in a better sanitary state than at any time since its erection.

7. During October I heard that a case of smallpox occurred in Trenton. I at once wrote to the Medical Health Officer at Trenton for particulars and asking him what precautions were taken. He wrote me that one case, that of a child, had broken out, and that it had been removed to the island, together with its mother and all those who had been in contact with it. I would suggest that the Council place a small sum to the credit of the Board to meet any case of this kind. Promptness in dealing with the first case would be the means of saving thousands of dollars to the city.

I cannot close my report without again recommending the City Council to pass a by-law doing away with the pit system of water-closets and adopting the dry-earth closets. By doing so the city would be healthier, the death rate would be lowered, and in case of an epidemic of cholera breaking out it could be easier stamped out than under the present system.

All of which is respectfully submitted.

R. TRACY, M.D.,

Medical Health Officer.

BRANTFORD.

Medical Health Officer's Report.

GENTLEMEN,—I have the honour to submit the following annual report upon the sanitary condition of the city of Brantford for the year 1886:—

The number of deaths registered up to November 1st is 150. Assuming the same rate of mortality for the remainder of the year the whole number for the year 1886 will be 180, making a death rate of $14\frac{1}{4}$ per thousand in population of 12,600, as compared with a death rate of 175 or $14\frac{1}{4}$ in 1875.

Owing to the fact that the law respecting the registration of contagious disease has been very much disregarded, it is impossible to give any estimate of the number of such cases in Brantford during the year.

Of measles, of a comparatively mild type, there have been a good many cases with no death reported.

There have been some cases of scarlet fever with one death reported.

Four deaths from diphtheria have thus far been reported.

On several occasions during the year epidemics of the above diseases have been threatened. Their extension, it is believed, has been to a good degree prevented by the measures taken rigidly to exclude from the public schools all children coming from any house where any sickness existed until it was shown that such sickness was not of an infectious character.

In the month of June four cases of undoubted varioloid (umbilicated varicella) occurred in the Mohawk Institution, within one mile of the city. As this disease is capable of imparting true smallpox, under favouring circumstances, great anxiety was felt as to the proper course to pursue. To close up the Institution and distribute ninety pupils through the reserve and other Indian settlements in Canada, carrying probably with them the germs of smallpox, was not to be thought of. The course decided on was to perform thorough vaccination, to completely isolate all affected pupils for a long period and to establish a partial quarantine of the Institution until the danger passed. By these measures the danger was rapidly obviated.

The number of deaths from typhoid fever registered up to the present date is four, exclusive of any that have occurred outside of the city limits. I regret, however, that this

conveys no idea of the amount of sickness from that disease, which has been unusually large since about the middle of August.

In the John H. Stratford Hospital alone there have been twenty-five cases during the three last months, and there are at this moment ten cases of typhoid there out of a total of 27 cases in hospital.

From my own knowledge and from such information as I can obtain from the city physicians, I am satisfied that the number of cases outside of the hospital, including those in the immediate suburbs, has been four times as many more, making in all, say 125 cases. Many of these cases have been very severe and of long duration, although the actual number of deaths has been exceptionally small.

Much anxious consideration has been given to this matter. The weather during the spring, summer and autumn, has been unusually salubrious, there having been no prolonged periods, either of excessive heat or of cold or damp. To what cause then are we to ascribe the presence of so much fever?

A large factor in the causation of fever as well of other zymotic diseases in the city is undoubtedly the want of pure drinking water. A very large proportion of the wells are to a greater or less degree fed by surface water filtered through a polluted soil, and as all the Brantford wells may, generally speaking, be said to tap the same pervading sheet of water, resting on a bed of clay and underlying at variable depths the superimposed sand and gravel, it may well be doubted whether there are many which are at all times perfectly reliable, although rough testing or even accurate chemical analysis may reveal the presence of but little organic matter.

An important cause for the exceptional amount of fever this year is, however, believed to have been the state of the basin of the canal. The condition of this basin is always bad, but this year it has been exceptionally bad, the dam at the feed gates having broken away in the spring the water of the river ceased to flow into the canal for some months, and large portions of the basin lying in the heart of the city became partially dry and covered with rank vegetation, other large portions being converted into a stagnant pond of slimy water, re-inforced by the filthy discharges from a number of drains and small sewers, the whole expanse being offensive to sight and smell, and obviously unwholesome in the last degree.

Numerous and loud complaints were made as to this dangerous nuisance, but there did not seem to be any way by which either the Local Board or the Provincial Board of Health could remedy the evil.

A number of places where typhoid fever existed were visited and thoroughly inspected. One or two may be specially referred to. In one block, on the plateau, in the east ward, in a dry and usually very healthy locality, there were ten cases of fever in five dwellings. The block contains about two acres, on which there are four single and two double dwellings, occupied by seven families, one single dwelling being unoccupied. The first one attacked was a moulder, in August; he was ill for about six weeks; no other member of his family was affected. The next case was in a dwelling about a hundred feet from the house where the first case occurred. This was a middle-aged woman, and her husband and four children were subsequently taken down. In the meantime a young girl in the next house, about sixty feet distant from the last, was stricken. Also a child in the house next adjoining. Lastly, in another dwelling, some sixty feet from the first one, the wife of the occupant had a mild attack. Some of these cases were very severe, and some have not yet recovered. It was found that in the second and third houses attacked, in which were seven of the ten cases, milk was obtained from the same place, and this milk was shewn to have an unpleasant taste. On visiting this dairy, the well from which water was got for rinsing the utensils was only eight or nine feet from the cow stable and from a large heap of manure, in such a position that it was impossible that the well should not be contaminated. It is probable that this cause may have contributed towards increasing the severity and duration of some of the cases.

The patient first attacked passed, in going to his work, along and across the canal basin a number of times daily, while it was in its most offensive state, and he says that it used to make him sick." He believes that his fever was caused thereby. The dis-

charges from this patient were buried in the garden about one hundred feet from the well on the premises next attached.

This well yields a large supply of water, evidently drawing its supplies from a wide range. The soil is very porous and, notwithstanding the distance, I think it possible may have been contaminated from the discharges of the first patient.

In another place, on the corner of Alfred and Darling streets, there were two severe cases of fever in two tenements in close proximity. The water here was bad; the well was only a few feet from an old closet; in an adjoining lot, at a short distance, was a soak pit into which slops were thrown. I do not know that in these last cases the fever was caused by the impure water, but every one must know that no human beings ought to be compelled to allay thirst with water obtained from such sources.

The only other supply of drinking water in Brantford besides that derived from the wells, is that obtained from Wilkes' creek by means of the waterworks. In some places, on account of the obvious badness of the well, this water is used and I think to a much greater extent than is generally supposed. This water has been examined a number of times, though not subjected to an exact chemical analysis. The samples examined have not appeared to contain much organic matter, and coming from a running stream exposed to air and sunlight, it is probable that it is not worse than that obtained from a majority of the wells; but the fact that the stream actually receives the drainage of many dwellings and that it is impossible to protect it from a host of other impurities, is sufficient to condemn it utterly. In case of contamination of this stream from any typhoid cases, fatal results may be expected.

Such being the state of the case, it seems to me that there is no room for difference of opinion on the question of the necessity of the City of Brantford taking measures without unnecessary delay to provide an ample supply of pure water for the use of its inhabitants.

Turning from the disagreeable subject of water to the more pleasant one of milk, I have to report that this matter has received faithful attention, with results which have been and will, I believe, continue to be most satisfactory.

Permits for the sale of milk were granted free of charge on July 1st and later, tenable to December 31st, subject to cancellation for infractions of the by-law, to 28 persons.

The dairies were nearly all situated in the township, and were all visited and thoroughly examined by the Sanitary Inspector, and full reports entered in a Milk Inspection book.

The instruments used by the Brooklyn Board of Health, by which the addition of water, removal of cream or retention of strippings may be readily ascertained, were obtained and twenty-four samples of milk have been tested.

The importance of milk inspection is much greater in the winter months than in the summer; and it is intended to enforce the law with great strictness, not only as to the adulteration of milk, but as to the uncleanness of the byres, unhealthiness of the cattle, and as to the use of putrescent and other improper foods, and of impure water.

During the year Mr. James, the Sanitary Inspector, has made 620 house-to-house inspections. 155 complaints were entered on the complaint books; 42 of these referred to offensive closets and cesspools, some of which were condemned, dry-closets being substituted and the residue properly cleaned; 9 related to offensive manure heaps; 5 to the deposit of dead animals in the canal, in Wilkes' creek and other places; 1 only as to hog-pens; 1 only as to slaughter-houses. Two complaints were made of old tenements in a dangerously filthy state; the occupants were finally got out of these places and both were pulled down. Thirty-nine complaints were made of foul wells, 4 of which were condemned and filled up, and the others cleaned. Many more would have been condemned if there had been any other supply of water obtainable.

Several complaints were made in reference to the draining of houses into Wilkes' creek. This is one of the matters which has not been disposed of, and to which I invite the attention of the Board.

Complaints were also made as to the filthy state of the Market square. A weekly cleaning of this square is now enforced.

Early in the year many urgent complaints were made against the Market street drain, which, originally intended for draining water from cellars, was used for sewage purposes. The drain becoming obstructed, the contents were forced back into the cellars of several shops. Failing in every other means to remedy this evil, it was found necessary, in the face of much opposition, to open up the drain and wholly cut off some of the connections.

Several other drains were complained of, notably the untrapped drain from the meat market discharging the washings of the stalls, refuse, scraps of meat and other garbage into a large soak pit on the square, into which pit the sewage from the water-closets in the building was also discharged. The only free exit for the foul gases of this pit was into the meat stalls.

This nuisance was totally abolished, dry-earth closets introduced, and the pit and drain filled up.

The violent opposition made to the removal of this most dangerous nuisance well illustrates the desirability of a wider diffusion of knowledge on sanitary matters.

A case of typhoid fever and one or two of diphtheria at the Orphanage, occupied by some fourteen children and others, led to an inspection, which showed that the wash-room, bath-room and sinks all emptied into a large vault, from which the putrid air had no escape whatever, except into the house, the atmosphere of which in some of the rooms in the morning was said to be exceedingly bad.

At the J. N. Stratford Hospital, complaint having been made by persons passing on the Tranquility road, it was found on inspection that all of the refuse, liquids from the kitchen, laundry and baths, as well as all the hospital sewage were discharged into an enormous pit near the road, unprovided with any ventilation pipes, that this pit becoming full had burst out, and a running stream of sewage escaped into the public highway.

The Governors of the Hospital expressed their willingness to incur any expense requisite to remedy this serious state of affairs. A system of treating this refuse by downward filtration—a modification of Col. Waring's plan,—was therefore devised and established, the situation of the Hospital being very favorable for this. The details cannot here be explained. After a trial of four months this plan proved to be entirely successful.

The above are some of the more important matters which require attention during the year.

With regard to the dry-closet system, it may be said that a great many buildings have been erected during the year, in nearly all of which this system has been adopted. It has been further extended in the public schools, connected with which it is intended, next year, to abolish the last of the old closets which remain. Owing to ignorance, indifference and laziness, and consequently improper management, this system has been unsatisfactory to some, but its merits are beyond question, and within the range of its applicability it must entirely supercede the old vault system.

Unfortunately this system is not well adapted to the disposal of liquid refuse in any considerable quantities. In places closely built up and in the central parts of the city, the demand for relief in this respect has become urgent.

It is less injurious that liquid refuse should be discharged into the street, exposed to the air and sun, than that it should be retained in pools or soak-pots, or even in ventilated cisterns in small yards. But even if such liquids could be speedily carried off by the street gutters, they must be received into the canal basin where there being little or no current, they must remain for long periods an offence to the sight and a standing danger to health. This basin now receives a certain amount of sewage and very much liquid refuse through drains and otherwise from the Kirby House and Post Office, and from the various buildings adjacent to its banks.

The proposal to fill up this basin, confining the water to a channel on its south side, obviously implies the necessity of providing for some means of carrying off the refuse it now receives.

From both of these pressing circumstances, it seems that a certain amount of sewerage for the central part of the city is required.

If any such works be undertaken they should, of course, be of a permanent character and adapted to meet all further requirements.

I desire to thank the Mayor and Aldermen of the city, and particularly those who are members of the Board of Health, for their cheerful support given during the year, and especially to thank Mr. Woodyatt, the Secretary, for much useful assistance and advice.

I cannot too warmly express my appreciation of the invaluable services of P. C. James, in performing in a thoroughly capable and efficient manner his manifold duties as Sanitary Inspector.

All of which is respectfully submitted.

EGERTON GRIFFIN, M.D.,
Medical Health Officer.

GUELPH.

Medical Health Officer's Report.

I have the honor to submit the following Report as Medical Health Officer for the city :—

The general health of the city during the greater part of this year has been unusually good ; with the exception of diphtheria, no epidemics have prevailed to any extent. During the latter part of last year and the beginning of this, a large number of cases of this disease was reported—seventy-four in all—but at present time there are not any cases in the city. The number of deaths registered from the 15th of November, 1885, up to 5th November, 1886, is one hundred and eighty-six, giving a death-rate of 18.1 per 1,000 in a population of 10,250, which I am informed by the city clerk was the number of the inhabitants for the past year.

The work of sanitary inspection has gone steadily on, and a large number of yards and closets have been examined by the inspector, and many nuisances abated ; pig-stys have been practically abolished, only a few isolated ones remaining—their owners preferring to abandon them rather than submit to the requirements of the law. Scarcely any complaints have been made at the inspector's office this year regarding piggeries, while last year scarcely a day passed without a complaint being made. And with regard to slaughter-houses—those complained of last year have been removed outside the city limits ; those within the city limits have been carefully watched and kept clean.

For promoting the cleanliness and health of the city, as well as for the great convenience and comfort of all, one of the most urgent needs at present is an efficient means for the frequent removal of garbage. The almost unavoidable presence of decaying vegetable and animal refuse in private yards is very unwholesome and offensive, and it is important that the Board should give its attention to this matter as soon as possible.

A large number of the wells in the city have been reported by the inspector as being too near the water closets, and that a great many of the wells are polluted by the surface water running into them, thereby making the water unfit for drinking purposes. This surface water *must* pollute the wells by its drainage into them, and nothing is more inimical to the health of the community than water befouled by decomposing, organic or vegetable matter, and the only remedy that I know of is to close up the wells and compel the people to use the city water, which I consider is pure.

In many places throughout the city the much-to-be-condemned practice of throwing kitchen refuse and waste water on the surface of the ground in the yard or in the street, still prevails. The disposal of garbage in every well regulated household is a matter of no small importance. From the inspector's report, I note with pleasure that the laudable practice of burning all solid kitchen refuse is being carried out by many. The removal of objectionable matter from the yards or outbuildings was enforced in all cases.

The sanitary inspector reports the following sanitary work done during the past year :—

Number of yards examined	236
“ water closets emptied	200
“ yards found in good condition	100
“ yards cleaned	400
“ hog-pens removed	26
“ notices served for dirty yards and closets	52
“ old wells closed	4
“ analysis of well water	4
“ horses buried	25
“ cows buried	8

Contagious diseases reported to the inspector by medical gentlemen of the city :—

Scarlet fever	6
Diphtheria	74
Typhoid fever	10
Houses placarded	80

Report of the expenses incurred by the Board during the past year :—

Amount granted by the Council..... \$350 00

Expenditure.

Printing contagious disease cards	\$ 28 05
Furniture for pest house	105 19
Vaccine and vaccinating poor	25 55
Stationery for office	3 15
Removing dead animals and other nuisances	49 70
Special grant to Mr. Hughes	60 00
Rent for nuisance ground	50 00
Printing annual report	10 00
Filling up quarry hole on Waterloo avenue	4 00
Vaccine matter	4 00
Medical examination	8 00
Balance to credit	2 36
	<u>\$350 00</u>

In conclusion, I have much pleasure in stating that the sanitary inspector has performed his duties to my entire satisfaction.

THOMAS A. KEATING,
Medical Health Officer.

KINGSTON.

Medical Health Officer's Report.

In accordance with the regulations of *The Public Health Act of 1884*, I beg leave to summarize the work done, and briefly note the sanitary condition of our city :—

The general health during the past year has been unusually good, the death-rate small, except for the few cases of scarlet fever in the beginning of the year, (the relics of our epidemic of 1885). The cases reported this year number 49, as against 296 in 1885, show conclusively that the epidemic is over.

There have been reported six cases of diphtheria, a few cases of measles, and quite a number of cases of whooping cough; also a few cases of typhoid fever, though not a single death has occurred from the latter disease.

The water supply of our city is not what it should be; the receiving pipe ought to be extended further out into the river, so as to escape every possible likelihood of contamination by the residue flowing down the stream of sewage and other pollutions escaping into the river from the asylum, penitentiary, and other sources of like character; the receiving pipe of the water works only being extended into the river about 237 feet from where the company's pumps are located, and at a depth of sixteen feet of water.

If the water works were under the control and management of the city proper, these evils might then be remedied; and, further, the mains might then be extended to parts of the city where they do not now exist, and the poorer classes of the community would then have the privilege of obtaining purer water than they can possibly now enjoy, and wells that are now in use could be closed up. Many of these wells in the upper part of the city are not fit for use, owing to the pollution of the soil from soakage of privy-pits, cesspools, cow-byres, and other such sources.

During the year past 203 privy vaults have been thoroughly cleansed out and disinfected with lime. The emptying of privy vaults has been done by the odorless system, regulated by by-law, with a fixed charge of \$2 per cubic yard of matter removed. The contents are taken to the nuisance ground and there deposited in trenches, deodorized by means of quicklime, and then covered with earth.

The dangerous practice of allowing the solid contents of privies to escape directly into our drains should be remedied at once. I have prevented it being done in a great number of instances. Such a condition of things should not be allowed, on account of the filling up of our sewers, polluting the waters of the harbour, causing a terrific effluvia to escape into and vitiate the air at the corners of the streets where the sewers open, and into dwelling houses not provided with stench traps; and many such houses there are in the city.

Dry-earth closets have been instituted in places where privy vaults have been considered dangerous—that is in, small yards, etc. Twenty-three dry-earth closets have been erected this year, those having them seem to be perfectly satisfied with the improvement, and I have no doubt before the end of another year I shall be able to report a much larger number of such closets in use.

In places where shallow pits were permissible, I have caused them to be erected (in place of the deep pits so commonly used), the same made water-tight to prevent the escape of any of the contents. The main point gained in having the pits shallow is, they will have to be regularly emptied.

Garbage and dry-earth closet contents are attended to and removed daily, weekly, or as required by the parties, by a scavenger whom we have agreed with to collect and take charge of them in a proper manner. This part of the work, to do it efficiently, should be regulated by by-law of the corporation, appointing a responsible person to do the work at fixed charges, and whose duty it would be to remove the matter daily from all premises; then we would have the necessary control of the work.

The practice of throwing (as it is too often done now) kitchen refuse and slop water on the surface of the ground in yards or streets, is very injurious to the health of the public and ought to be condemned. Nevertheless, in many instances, the cause is want of drainage. Some means should be devised to remedy the evil until such times as drains are constructed.

DRAINAGE.—Our city, until the present year, has been inefficiently drained, although the location is one capable of being easily drained, the highest point of the city being 77½ feet above the waters of the lake.

There has been \$7,500 spent in the construction of sewers and drains, 6,000 feet having been built during the present year, so that by the end of 1887, with the carrying out of the drains in contemplation, our city will be comparatively well drained for some time to come.

The impetus given by sanitary reform has been marked in our city by the steady and constant attention paid by individuals to keeping their places clean. The number of cellars

cleaned out, the many wells emptied, remodelled and put in better condition than they have been for many years, all go to prove that by constant attention to matters of cleanliness, etc., in the course of a short time the people will be educated in such a manner that we will not have to wait until an epidemic appears amongst us to cause our citizens to awake to the necessity of a strict observance of the laws relating to health.

Before closing, I would refer, as I have already done in my last report, to the condition of our streets. During the dry season I think they should be scraped oftener than they have been, as they are, no doubt, the cause of many diseases.

All of which is respectfully submitted.

SAML. H. FEE,
Medical Health Officer.

LONDON.

Medical Health Officer's Report.

In compliance with the requirements of the Public Health Act, I have the honor to lay before you my annual report on the sanitary condition of the city. During the year ending November 15th, the city has been remarkably free from disease. Diphtheria and typhoid fever prevailed to some extent in the 5th ward, where drainage is defective and well water in consequence notoriously bad. Still these diseases were of milder types, and more amenable to treatment than formerly. This is due to the better sanitary condition in which the city now is. No epidemic has visited the city during the year, and the mortality from all diseases was low. Consumption, as it does in all temperate climates, heads the list.

Much has been done to improve the condition of the city. Many unhealthy places have been visited by the Sanitary Inspector and myself, and many nuisances abated. Foul wells have been cleaned or filled up, and city water is gradually taking the place of impure well-water.

The construction of sewers has been pushed on as fast as possible. Sewer pipes have been laid during the year as follows: On Colborne street, from Grey to South streets; on Grey, from Wellington to Colborne; on Simcoe, from Wellington to Clarence; on Bathurst, west of Richmond; on South, from Colborne to Maitland—(this one was very much needed on account of the hospital); on Talbot, from King to York; on Kent, west of Richmond; on Ridout, west of Maple, and one is now being constructed on Horton street, from Clarence to Richmond streets.

The drain or ditch running through private property from Queen's avenue to Lorne avenue in London East, is still in the same unsanitary condition it was a year ago. This drain or ditch is the cause of a great deal of the sickness in that neighborhood, and the Board of Health should take prompt measures to put an end to this nuisance once for all, either by having it done at the expense of the Board, or by compelling the owners of the property to open and maintain this drain. This can readily be done under sections 3, 5, 6 and 7 of the "Act respecting Ditches and Watercourses" of 1883, which provides that "owners of lands, whether immediately adjoining or not, which would be benefited by making a ditch or drain, or drain already made in a natural watercourse, or by deepening or widening a ditch or drain for the purpose of taking off surplus water, or in order to make the owners or occupiers thereof the better to cultivate or use the same, such owner shall open and make, deepen or widen, a just and fair proportion of such ditch or drain." Prompt action is necessary. The city has done its part by putting down a tile drain to meet this natural watercourse at Lorne avenue, and nothing remains to be done but open and widen this ditch from Queen's avenue to Lorne avenue, to make this swamp as healthy as any part of the city.

In connection with this is the growing necessity of constructing a trunk sewer along Carling's creek to connect with one from the asylum. There are two ways in which this

can be done. One would be to make a sewer along the line of the C. P. R. to connect say at English street, with one from the asylum.

The other way would be to make a trunk sewer along Carling's creek, from the river to Elizabeth street, connecting there with one from the asylum. The latter plan is the most feasible, and from present indications the Provincial Government seems desirous to assist.

DISPOSAL OF SEWAGE.—The Board has now under consideration the subject of devising means for the disposal of sewage, either by a process of destruction by chemicals or filtering. Several cities in the United States and one in Canada have adopted the latter process, and use the Hyatt Filter, made in Newark, New Jersey. This filter so far has answered the purpose well,—two or three of these filters put down at the intersection of the trunk lines, would be sufficient for the city. The Hyatt filter has a capacity of between 300 and 400 gallons per minute.

The by-law preventing the sinking of privy-pits is, although meeting with some opposition, being enforced, but there is a matter connected with this to which I wish to draw the attention of the Board. As the law now is, these closets are not allowed to be placed nearer a dwelling than fifteen feet; that is all very well, but many of these closets are placed immediately against the line fence, right in front of his neighbor's dining-room or kitchen windows. This is a grievance, and should be remedied by placing these closets at the rear of the lot, an equal distance from his neighbor's fence.

THE DISPOSAL OF GARBAGE must sooner or later engage the attention of the Board. As it is now, garbage is dumped here, there and everywhere, to the great annoyance of the public, and as the city does not possess a farm for this purpose, destruction by fire is certainly the next best method. For this purpose a crematory would be necessary. These are now used in many cities and towns in England. One large enough for this city could be built for about \$2,000; very little fuel would be required, the crematory making its own fuel by first drying the garbage in a kiln placed over the furnace, and would only require the services of one man. In the meantime it would be well to procure some place or places where this refuse matter could be deposited.

T. O. HUTCHINSON, M.D.,
Medical Health Officer.

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OTTAWA.

Medical Health Officer's Report.

I beg leave to lay before you my annual report for the year ending on October 30th, 1886.

In doing so it is satisfactory to be enabled to state that at no time during the year has there been in our city anything like an approach to an epidemic of any contagious disease with the exception of measles, which prevailed extensively during the latter part of the winter and in the early part of the spring months.

Notwithstanding this fact, however, the mortality for the last twelve months, as will appear from mortuary returns here given, has been larger by 208 deaths than during the corresponding period of the year 1885.

This increased mortality, however, is not always an exact test of the sanitary condition of a city, so far as it is influenced by the labours of sanitary organizations. It may be, as it was in our case, partly the result of influences not altogether controllable, and partly due to legitimate causes.

Out of this increase of 208 deaths, 127 were of infants cut off during that critical time of their development, commonly known as the period of dentition within the two first years of existence.

Though it must be conceded that the death-rate of infants will of a necessity be larger among those who are less favourably situated, whether as regards the conditions of the dwelling house and surroundings, or other requisites of the laws of health which money

can procure, there is no reason that in a young city like ours, where little or nothing is known of that overcrowding of people and squalid poverty, which are seemingly the inevitable inheritance of older cities and larger aggregations of people, why so great a mortality should exist amongst infants. The foundling institution in our city, no doubt, largely contributed to swell the death roll of infant mortality, and can legitimately be considered as instigating to a considerable extent this unenviable record. But aside of this, the mortality of infants in our city is larger and much beyond what should be reasonably expected; and I have no hesitation in stating that to a very large extent, indeed, it is the result of ignorance or criminal indifference of parents not to care as they should for their infants at that particular time of their existence, either as regards proper food or otherwise.

Deaths resulting from diphtheria during the period comprised in this report, were also in excess of those occurring last year.

That our sanitary condition, knowledge of the laws of health and conformity of conduct thereto, will ever be such as to leave the community altogether free and incapable of fostering the development of any such maladies, is beyond our expectations; but their victims would undoubtedly be very many less, were not the public generally (there are exceptions) so wilfully indifferent in taking necessary precautions to prevent their spread, and so obstinately refuse compliance with that rule of health laws exacting notification of health authorities of the existence of any such case in any household. Typhoid fever, also, has been somewhat more prevalent during the latter part of last summer and fall than during the corresponding period of the previous year. This, I think, to a large extent may be attributed to atmospheric influences and to the upturning of the soil necessitated by the extensive subsidiary drainage, and other sanitary works of improvements going on in every part of the city. Smallpox, during the last year, has also added its victims to the mortuary list; and though the number of cases of this disease was not very large, the death-rate among them was more than the usual average—due partly to the fact that a large number of them were adults under the most unfavourable condition.

As regards this, however, though the community may justly deplore the loss of those who fell victims to this loathsome disease, it has good reason to congratulate your Board and the Provincial Health authorities in so successfully staying the ravages of this pestilence to so limited a few, in view of the fact that for many months our city had been daily and in many ways assailed by external sources of infection. Then, again, as a last factor, and a normal one in our increased mortuary returns, our natural yearly increase of population should not be ignored.

The many cases of so-called preventable diseases occurring in our city during the year, are no doubt a pretty sure measure of its sanitary condition, which evidently leaves us yet much to be desired, and offers a wide field of labour to be done. It cannot be denied, however, that last year was for Ottawa an epoch marked by substantial progress in that which is the very basis of sanitation. I refer to the completion of the subsidiary drainage in a large extent of the city, St. George's Ward in this respect taking the lead, being now almost from end to end compassed by a perfected system of sewers.

The replacing of the old key-stone drains on Sussex and York streets by properly constructed sewers, should be duly appreciated by the inhabitants of that section of the city, not only removing what must have become in the near future a prolific source of disease, but also as a work which now affords them all facilities for the drainage of their property, as well as the adoption of modern accommodations in the dwelling-house. This improvement, I am happy to note, has also enabled the corporation to efficiently drain the public market in that part of the city, a want long and sorely felt by many, and by none more than by the health authorities themselves.

The privy-vault, or pit, which prevails so extensively throughout the city, has been last year, as in the past, the most frequent nuisance complained of. Many are old and decayed, and many more are defectively made, allowing contents to escape in the soil which becomes saturated with the offensive matter, and in due course of time is a source of unhealthiness; in thickly populated districts privy-vaults are dangerous and should go.

In by far too many places yet, even in the most important business portions of the city, the all permeating offensive privy-vault retains its place ; proprietors of such should now realize the necessity of replacing them with the more modern and safer appliances, in compliance with the requirements of the lives and laws of sanitation.

The time has arrived at all events, and the proportions attained by our city such as to justify the hope, that at no distant day special sanitary regulations will compel owners of property in certain sections of the city, when our system of sewers have been perfected to do away with the privy-vault, leaving in its stead the water-closet or the dry-earth closet, which can be made to serve equally well the purposes of sanitation.

The removal of night-soil, which last year dragged throughout the whole year instead of being done within a certain time specified by contract, was as usual under the supervision of two inspectors, corporation employees, who are watchfull that this work is done in a proper way, and that just remuneration only is demanded in payment thereof. The difficulty of procuring dumping ground having been got over for a few years at all events, it is to be hoped that this work will be done more promptly during the winter months, thereby avoiding a great deal of dissatisfaction to the public and annoyance to the health authorities. The disposal of household garbage which, in a sanitary point of view, is a matter of much importance in our city, is as yet very unsatisfactory and a very frequent source of serious trouble to many householder. The organization of a proper system of scavenging is here much needed, and its establishment very anxiously looked for at no distant day by a large portion of the community.

The house to house inspection, with a view of enforcing cleanliness of yards and premises this year, was not I fear as satisfactory as it could have been desired, owing in a great measure to the fact that the removal of night soil extended during the summer months, occupying, therefore, a great deal of the time of the inspectors. In connection with this, I would respectfully recommend a most thorough house to house inspection next year, not only with the object of enforcing cleanliness by the removal of offensive matter from yards and premises, but specially with a view of enforcing proper private drainage wherever our public sewers have been perfected, and the placing of sinks in dwelling houses, thereby doing away with the very objectionable practice of throwing the house slops and waste water on the surface of the ground, at the back kitchen door or on the street. All complaints of nuisances, however, have been attended to as promptly as circumstances permitted ; and next year I am confident will inaugurate a more efficient system of working, which will no doubt be more satisfactory to the Board of Health, whilst it will also prove more conducive to the public welfare.

The isolation of persons suffering from contagious diseases, when known to me, has been duly carried out, either at domicile or in hospitals specially maintained for this purpose, and the public impressed with the vital importance of this measure ; but the fact is, that with the exception of Smallpox, the public seemingly have not yet realized that they are in duty bound by health laws to notify health authorities of the occurrence of any such diseases as Diphtheria, Scarlet and Typhoid fevers. It will be my duty, however, to wake the public up to a sense of their responsibilities in this matter ; and it is my firm resolution in future to enforce this measure, which wisely looks to the interest of the unfortunate who may be so afflicted, and provides as well for the safety of the whole community. The alarm caused some months ago by an outbreak of Smallpox having passed away, little is heard of vaccination now ; and the law compelling parents to have their children vaccinated is ignored, until such time as another panic causes another rush for the doctor's office, forgetful that prevention is a thousand times better than cure, and that safety is the reward of eternal vigilance. To remind the public of their duty in this all-important question, I would most respectfully recommend that during the winter months a thorough inspection of all the schools in this city be made, with a view of having all children bearing no marks of previous successful vaccination submitted to this measure of prevention. Mortuary returns here attached have been as carefully made by me as it was in my power to do ; the fact, however, that the cause of death is in many instances given by incompetent persons and consequently incorrectly given, detracts very materially from their value or usefulness in preventive medicine.

This serious defect will only be remedied when blank forms are supplied to all the practicing physicians of this city, who I have no doubt would faithfully and correctly record the cause of all deaths occurring in their practice.

Respectfully submitted.

A. ROBILLARD,

Medical Health Officer.

ST. CATHARINES.

Chairman's Report.

In accordance with the provisions of The Public Health Act of 1884, I have the honour to submit the third annual report of your local Board of Health for the year ending 30th November, 1886.

Attached hereto is the report of the Sanitary Inspector, giving a detailed statement of the duties performed by him, also an account of the work done by the city scavenger.

Your Board continued, during the season, from November, 1885, till May, 1886, the work of cleaning cesspools, privy-vaults, etc., the work being done in a manner generally satisfactory to the public, and at a more reasonable figure than formerly. This season the Board has arranged for the removal of night-soil, etc., on a basis which will meet with the approval of all classes, viz., a barrel system. The Inspector's report will show the quantity of night-soil, etc., removed from the city during the past year.

The Inspector has made regular tests of the milk offered for sale by the licensed vendors, and has noted a decided improvement in the quality.

Frequent inspections have also been made of the cow-byres, which are found to be clean and well kept; the quality of food furnished the cows good and wholesome, and the condition of the cattle all that can be desired.

Slaughter-house inspection has also been carried on, these places being kept in a very satisfactory condition.

One of the greatest sources of trouble which the Board has to deal with is the pig nuisance; and we would recommend that The Public Health Act be so amended as to prevent the keeping of hogs within city limits.

The streets, lanes and alleys have been kept very free from garbage and filth, although the Inspector has been compelled to threaten legal proceedings against several persons who habitually break the law in this respect.

The Board has been put to considerable expense during the year in the removal of dead animals from off the streets—cats, dogs, and in one instance a horse had to be removed at public expense, the Inspector being unable to discover the owner.

During the year the Board of Works has had traps placed in the catch-basins of the King and Queen street sewer (as recommended in our last report), with the erection of an automatic flushing tank at the head of this drain; and the discharge of its mouth carried into level one below lock No. 2, (which we believe the Board of Works contemplate doing as soon as the weather will permit), serious cause of complaint will have been removed.

The health of the city during the past year has been very satisfactory, the total number of burials being 174.

On the 4th January last, a report was sent to the Board of Health that a girl belonging to a poor colored family on North street, was sick with symptoms of smallpox. A physician was sent at once to see the case, who reported that the patient was suffering from that disease. A special meeting of the Board was called, and it was decided to remove the whole family of a mother and five children to the hospital. This was done at once, and the late Dr. Sullivan, a member of the Board, given charge of the patients. The whole family contracted the disease, but all recovered. They received, at public expense, medical attendance for thirty-nine days. During their occupancy of the hospital the mother was confined, but the infant did not contract the disease.

After the hospital had been thoroughly cleaned and disinfected, the services of a caretaker was secured, who now resides in the building, and to whom is paid a nominal sum.

During the year the Board met with a severe loss in the death of one of its members, the late Dr. Sullivan.

In conclusion the Board would congratulate the citizens on the absence of any epidemic during the year, and on the general healthfulness of the city.

The Sanitary Inspector has continued to perform his duties to the satisfaction of the Board.

All of which is respectfully submitted.

GEO. C. CARLISLE,
Chairman.

TORONTO.

Abstracts from Report of the Board and of the Medical Health Officer.

Your Board beg leave to submit, for the information of the Council, a brief resume of its work during the year 1886, and would ask that the same be transmitted to the Provincial Board of Health, as required by the provisions of the Public Health Act.

When the Report of last year was closed there were but two cases of smallpox remaining in the city; but, unfortunately, the germs of the disease had been disseminated from intercourse with the Province of Quebec, and in consequence of the malady having been concealed in a family, it appeared again and again in different parts of the city. The disease never assumed by any means the character of an epidemic, but at one time considerable anxiety was felt because of its repeated appearance, owing to not being able to trace the origin. It being quite apparent to your Board that some unknown centre of contagion existed, diligent steps were at once ordered to be taken to discover its whereabouts, which eventually proved successful. A young woman, a tailoress, had contracted the disease in a mild form, and several members of the family with which she was living became affected; meanwhile, she was working daily at the shop with the smallpox virus about her person; in that way the infection was carried to various parts of the city.

The total number of verified cases of disease during the period extending from the 9th of August, 1885, to the 10th of February, 1886, was twenty-eight. All but the first two (a child and its mother) were cared for at the Smallpox Hospital, the total number of deaths being three.

491 visits were paid by order of the Board to quarantined families; 20 houses were disinfected, and 60 cases were reported which required watching, involving over two hundred visits by the Medical Health Officer and his assistants.

In the early part of the year free vaccination was provided, medical assistants being appointed by your Board to vaccinate all applicants, at the Medical Health Office daily, and at the St. Andrew's and St. Paul's Halls, and the Wilton Avenue Fire Hall, every other day from 2 to 5 p.m. In addition to the above, the Board felt it necessary to open an additional vaccination station in St. Matthew's Ward, in all some 15,000 persons being thus vaccinated free of charge.

There seems to be an idea prevalent among the public that vaccination is not compulsory, and order in to remove any doubts that might have existed the Board had large posters printed and distributed throughout the city, informing the citizens of the provisions of the Public Health Act relating thereto.

In their house to house inspection the inspectors reported that there were no less than 4,116 persons who were never vaccinated, and 11,084 who had not been vaccinated within seven years, and this applies to about one-half of the City which only was inspected.

On the 30th March six policemen were placed at the disposal of the Board as sanitary inspectors, and in addition the Board appointed four or five others. They proceeded to make a house to house inspection, bringing to light the existence of many sanitary evils, the majority of which your Board has successfully removed. The good results of a house to house inspection cannot be too highly appreciated.

On the 18th of February your Board found it incumbent upon them to request the Water Works Committee to place water mains on all the streets of the city which were not provided with the same. The City Council had not the funds, unfortunately, to meet the necessarily heavy expenditure connected with so great a work. However, a good work has been done by the city in this direction, a large sum was obtained and a very great number of mains were laid. This recommendation was made with a view to ordering the closing up of all the wells in the city, as they cannot, no matter how great care is taken of them, be pure and fit for human consumption in the crowded parts of a large city.

It was recommended by the Board on the 13th March last, that connection should be made where practicable between the draughts of boilers and the public sewers, with a view to their ventilation. The Board regrets that this has not been carried out.

It having come to the knowledge of your Board that a very large number of houses and lots were unprovided with drainage of any description, it was ordered that all buildings and vacant lots be forthwith drained into the city sewers. That this order is being carried out as rapidly as possible, it may be mentioned that the Board of Works Department has been unable to keep pace with the demand for private drains.

It was also reported to your Board that a great many privy vaults in the city had not been cleaned out or disinfected for years. As such a state of things could not be tolerated, your Board at once took steps to notify the public that all privy pits in the City must be cleaned out and thoroughly disinfected before the first of July in each year. The Board also forbade the public, in the future, to place such vaults on their premises, but to use in future proper modern sanitary appliances.

The Island opposite the city having become a great resort for camping parties during the summer months, great complaints were made by the residents thereof that the campers were not supplied with proper means for removal of excreta, etc. It was, therefore, ordered by the Board that no camping parties be allowed on the Island unless they were provided with earth closets, and it was recommended to the Property Committee that a small sum should be paid for the privilege of camping thereon. The object of the charge was to provide a fund for the purpose of meeting the expense of furnishing the earth, which had to be brought over from the city. The scheme was found to work admirably, and no complaints have since been heard from Island residents in this particular.

The inspectors in making their rounds discovered that the site for the proposed new Court House had been left in a most filthy condition, the cess pools, etc., not being cleaned out and filled. The Board at once took the matter in hand and had the site placed in a cleanly position.

The Board was waited upon by a deputation of citizens residing on Concord and Ossington Avenues, who stated that they were unable to procure water for their premises, there being only one well on the two avenues, and that of doubtful purity, to supply the inhabitants thereof. A sample of the water from this well was obtained and forwarded to Mr. Thomas Heys for analysis, who reported that the water was unfit for human consumption. Accordingly, there being no other alternative, the Board requested the City Council to lay down water mains upon these avenues, which was done, and the inhabitants have now a supply of good city water.

A lengthy communication was received by your Board some time during the month of May from the Provincial Board of Health, complaining of the unsanitary condition of the Western Cattle Market. The Board at once ordered an inspection of the premises, but the Medical Health Officer could find nothing of an alarming nature, as set forth in the communication of the Provincial Board of Health. Wishing to satisfy themselves that the report of the Medical Health Officer was correct, the Board undertook a personal inspection, which resulted in a confirmation of the Medical Health Officer's report. As a consequence, the facts thus ascertained were forwarded to the Provincial Board of Health, the communication also stating that it was the intention of the City Council to

spend a large sum of money in modernizing and improving the market, which your Board is glad to be able to report is now being done, much to the convenience of cattle buyers and the public generally.

The attention of the Board having been repeatedly called to the condition of the building known as the "London House," has requested the City Solicitor to at once take legal proceedings against the owners and lessees of the premises to at once compel them to place them in a thorough sanitary condition. Proceedings are now pending, as also against the trustees and proprietor of the New Arundel Hotel, and the owners of several premises on Duchess street.

A By-law was introduced by your Board and adopted by the City Council amending the By-law now in force in every Municipality as appended to the "Public Health Act," the object of the By-law being to prevent the running of blood and offal into the sewers of the city from the slaughter houses, and to compel the removal of the same in air-tight vessels. The By-law also enacts that the slaughter houses are to be provided with a tight non-absorbent flooring running to a centre, so that all the blood, etc., may be easily collected and removed, and with a supply of city water, for the purpose of thoroughly flushing it each time the same is used.

A By-law has been under the consideration of your Board for some time respecting the licensing of plumbers. The Bill, which has received most careful and thoughtful consideration, will be introduced to Council at its next meeting, when it is hoped it will become law.

The attention of your Board has been frequently called to the fact that there is no By-law regulating the drainage of land and buildings. It is proposed, therefore, at an early day, that a By-law be introduced for the purpose of regulating the same.

The fact that the Smallpox Hospital is situated in one of the most beautiful and largely growing portions of the city, has caused the Board much anxiety and thought. On several occasions the Board spent days looking at what were suggested as suitable sites for the removal of the hospital. None, however, were secured, and it is recommended that it be a matter of earnest consideration for the next Board.

The attention of the Board having been called to the state of the Rosedale Creek, an inspection was ordered. The report of such inspection was to the effect that "Rosedale Creek, from Avenue Road to its mouth, where it empties into the Don, shows it to be nothing better than an open sewer." The matter was referred to the Committee on Works, who have recommended that a sewer be made of the bed of the creek. Your Board would urge the immediate adoption of the necessary steps for abating a sanitary evil fraught with so much danger to the large section of the community resident in its vicinity. In the meantime it remains a source of danger to persons residing in its neighbourhood.

Frequent complaints having been made to your Board as to the unsatisfactory condition of the privy and water closets at the Public Schools, an order was issued to the School Board requesting them to do away with said privies and water closets, and to provide in their stead a proper system of sanitary improvements. The School Board evidently did not think the matter of much moment, and did not even treat this Board with the ordinary courtesy of an acknowledgment of the receipt of the communication. However, this Board has since issued a preemptory order, which, if not attended to forthwith, will compel this Board to take upon itself the enforcement of the order.

Notices have also been sent to the Separate School Board, University College and High School authorities, asking them to do away with privy vaults, and substitute therefor proper sanitary appliances.

Respectfully submitted.

P. H. DRAYTON,

Chairman.

BOARD ROOM,
Toronto, November 15th, 1886.

Report of Medical Health Officer.

To the Chairman and Members of the Local Board of Health :

GENTLEMEN,—In February last, after the organization of the present Local Board of Health, I submitted the following recommendations as being of immediate importance :—

1. The placarding of houses in which exists either smallpox, scarlet fever or diphtheria.
2. The drainage of every lot and house within the built-up portions of the city.
3. The closing of all wells and cisterns.
4. To abolish all privy pits.
5. The appointment of a sanitary inspector of new buildings.
6. The appointment of a competent inspector of plumbing.
7. The work of house to house inspection to commence by the 1st of April.
8. Proper provisions to deal with the excrement upon the Island during the summer.

These suggestions having been considered by a sub-committee, it was resolved that it was not expedient to placard infected houses, as the course at present pursued by the Medical Health Officer accomplished the same purpose. Soil and house drainage was to be insisted upon as far as possible. That all wells with impure water and foul cisterns were to be closed. That the closing of privy pits was to be urged, and new ones not to be allowed until the approval in writing was obtained from the Medical Health Officer. The appointment of an Inspector of plumbing was deferred, as well of new buildings. The recommendation regarding the Island was adopted ; also that the work of house to house inspection should begin by the 1st of April.

Sanitary Police.—In the summer of 1883 Major Draper, learning that I had no sanitary inspectors, offered the services of a number of policemen for the work. The very valuable services rendered by them that season was duly acknowledged. Again, during the summer of 1884, eight policemen were detailed to perform similar work, which was done most satisfactorily. In 1885, instead of policemen six sanitary inspectors were appointed by the Board. But during the past summer I have again had the services of the police. On the 30th of March six policemen reported for sanitary duty. The work allotted to them was to attend to complaints of sanitary evils, and make house to house inspection. The house to house inspection on the previous year was commenced at the front and proceeded northward until the close of the season. This year the work was commenced at the streets where it terminated last year. The work of the police was divided into three districts, with two police inspectors to each division. They were instructed to attend in the first place to all the complaints, or specials, and then to devote the balance of their time to house to house inspection.

They have continued on sanitary duty up to date except about ten days in May, when they were withdrawn for other special work, and in September, when for twelve days they were on general duty on account of the Industrial Exhibition.

Preliminary Report.—They were directed first to take a survey of their respective districts and furnish a preliminary report.

New Buildings.—Before proceeding with the general work, they made an inspection of new buildings, either completed or in the course of erection, in respect to the general sanitary condition, especially the provision made for drainage and the disposal of excrement. The total number of new buildings visited was 405. Of these 329 were found to be satisfactory, 67 medium, and 9 bad.

Instructions to Sanitary Police.—Beside verbal instructions these following were given in writing :

1. Give the street and number.
2. The name of owner or agent.
3. The number of inmates.
4. Whether there is a soil or house drain.
5. The source of water supply.
6. The mode of disposal of refuse.
7. The situation and condition of privies.
8. The state of stables, disposal of manure.
9. In factories—number employed, privy accommodation, whether separate for females.
10. What sickness has occurred during the past year. Number of deaths and cause.
11. Number never vaccinated, and number not vaccinated within seven years.

Special Cases attended to by the Sanitary Police.—From the first of November, 1885, to the first of April, 198 complaints were attended to by the one sanitary inspector. After the police commenced work these cases were attended to by them. The total number from 1st of April to date is 2,918. Total during the year 3,116.

The sanitary inspectors were instructed to inspect the places complained of. Then, when any sanitary evil was found, to ascertain the responsible party, and if possible see him and state the matter to him, and what was required to be done, and learn if he would at once abate the evil. To do this it was often necessary to make several visits. Of course, this occupied a good deal of time. But the policy pursued by the Medical Health Department has always been to try to have evils removed by persuasion, and in educating the citizens to recognize the necessity of so doing. This course has proved very satisfactory. In a certain number of cases the responsible party could not be found, perhaps from being a non-resident. In such cases an official notice was mailed to him. In a certain number of other cases the responsible party would not attend to the requirements of the law, and an official notice was likewise sent to him. During the year 462 of these official notices have been issued; of this number 456 have been sent since the first of April. These notices explained the nature of the evil and specified the time permitted in which the work had to be done. After a time the place was re-inspected to ascertain if the notice had been attended to. In about 200 instances it was found that the evil had been promptly removed. Many more were subsequently found to have been made satisfactory. When it became apparent that the responsible party would not attend to the behests of the law, he was indicted before the Police Magistrate. This work has been in the hands of Inspector Copping, of the City Commissioner's Department. Altogether he has had 52 cases. Of these 48 cases were, under the pressure of the law, duly attended to.

Inspection of Slaughter Houses and Butcher Shops.—On the 15th of April the sanitary police were instructed to make a thorough inspection of the slaughter houses and butcher shops within the city. The number of slaughter houses reported as existing was 25. Of these, only 5 were found in a satisfactory condition, 14 being unsatisfactory, and 6 doubtful.

The reports upon the butcher shops stated that out of 143, the total number inspected, 105 were found in a satisfactory state, and 38 unsatisfactory. It was admitted at 18 places that slaughtering of calves and sheep occasionally took place. A circular was issued, dated May 10th, 1886, to every proprietor of slaughter houses and butcher shops reciting the law regarding them, and informing them that the law was to be

diligently enforced. This notice failing to produce any effect, an inspector was directed to notify each one personally. Even this failed to arouse those addressed. On the 11th of June a communication was addressed to this Board upon the matter, pointing out that mostly all of the proprietors of slaughter houses had failed to observe the requirements of the law as to distance of slaughter houses from dwellings and the street, and recommending as the surest remedy that one or more public slaughter houses should be established, and the private ones closed up. At last the butchers were aroused to action. They convened at the Medical Health Office where the matter was discussed. Afterwards they had a conference with Mayor Howland. Since then the butchers have formed an association, and have shown a commendable desire to meet the requirements of the Public Health Act. In fact, they have rendered valuable services to the Department by appointing an inspector, and by causing all the butchers to place their premises in a proper sanitary condition. Printed permits are now issued from this office upon application, and after due and satisfactory inspection has been made. In furtherance of this necessary reform a by-law was introduced by the Board.

On the 28th of May the Inspectors were instructed to visit and report upon all the places where milk is handled or sold, stating :—

- 1st. Where the cows are kept.
- 2nd. The condition of vessels in which the milk is carried or kept.
- 3rd. The source of the water used for washing vessels.
- 4th. The state of the premises.
- 5th. Examine the ice in use, and learn where it was cut.
- 6th. To give instructions where necessary, and insist upon thorough cleanliness.

One hundred and forty-five places were visited. Of these ninety-seven were found satisfactory and forty-eight unsatisfactory.

In a few cases it was found that well water was used for washing milk vessels. In these cases the water was examined, and invariably it was found unfit for the purpose. Consequently the proprietor was required to put in city water and close the well.

The arrangements in use by the several night soil excavators, in what manner the work was conducted, with regard to the vehicles, mode of removal, and as to place of deposit, received due attention, and instructions were given as to the best way of doing the work without causing a nuisance.

Inspection of Ice—On the 27th of July the Medical Health Officer inspected the character of the ice used by butchers who employ it to preserve food, with the special object of learning if impure ice was placed in contact with food. The result showed that at thirty-eight places the ice was clean, at thirty-nine doubtful. But in only four places was the ice in contact with food.

On the 19th of July inspectors were instructed to make an inspection of all the Public and Separate School buildings within the city, and report as to their sanitary condition.

1st. As to the kind and state of the building, condition of the basement, nature of the drainage, etc.

2nd. The kind of privies, and their condition.

3rd. Nature of the water supply.

4th. The condition of the ground and premises generally.

The reports were not altogether satisfactory, and were made known to the Chairman of the Public School Board, and steps were taken to have all sanitary evils abated. It was recommended that the Board should supply the caretaker of each school with a plentiful quantity of disinfectants, to be freely and frequently used.

The House of Providence was also inspected, and from time to time private premises. The most important of these was on Cecil street, where there was an alarming outbreak of diphtheria in April.

An inspector made an investigation regarding the outbreak of diphtheria, which led to the closing of Phœbe Street School.

Infectious Diseases.—An inspector was detailed, by order of the Board, to look after contagious and infectious diseases. Not only those reported by physicians and the School Board are attended to, but every supposed case, however it may be reported, is promptly investigated. In every case of typhoid fever and diphtheria he inspects the house and premises, and reports their condition. When they are found in an unsanitary condition, they are dealt with as specials.

Diphtheria and Scarlet Fever.—At the beginning of the year both scarlet fever and diphtheria were somewhat prevalent, and in a number of instances the physician reporting the disease, gave as the source, "the school at which the child attended." Consequently, a communication was addressed to the Chairman of both the Public School Board and the Separate School Board, asking that the head master of each school be instructed to be watchful at the re-opening of the schools after Christmas holidays, and to exclude children from every house where those diseases existed. Other precautions, as well as these, have not prevented an unusually large number of cases of diphtheria, though doubtless the number was thereby lessened. The disease may be due to some local cause, or it may be exposure. The disease is infectious, and may be contracted from one affected, or the virus may be carried by a person and communicated to another. However, it is very important that no communication should be had by school children with an infected house.

Mr. George McMurrich, immediately after he became Chairman of the Public School Board, expressed his desire to co-operate with me in preventing the spread of contagious diseases among the school children. The system adopted is as follows: As soon as a notice of infectious disease is received from a physician at the Medical Health Office the Inspector of Public Schools is notified of the fact and also the school attended by the family affected. The Head Master of that school is then in turn notified, and who has instructions to exclude all children from such house until a certificate is presented from a doctor that there is no danger of infection. It is a matter of some consequence with which this Board, I fear, will have to deal, that some of the physicians of Toronto fail to report cases of infectious diseases occurring in their practice. In passing I would say that I think this failure is due to forgetfulness more than anything else. Nevertheless a single failure may be the means of a serious outbreak, and the physicians should respect the behests of the law. (The alarming prevalence of the disease in the neighborhood of Phœbe street, which necessitated the closing of the school there, I fear was in a great measure due to the failure of a physician to report a case on Markham street). To meet this want of attention on the part of the doctors, (by arrangement made with the Chairman of the Public School Board), the several Head Masters, when a case of infection is reported to them, at once notifies Inspector Hughes at the School Board Office, and the information is at once conveyed to the Medical Health Office.

The Inspector for this work at once proceeds to investigate. He visits the house, ascertains the facts, and, if the report is verified, he learns the name of the physician attending, and then takes to him a blank form to properly report the case. By these means there is afforded very full protection so far as school children are concerned. Fortunately a good many of the cases reported by the school masters are found upon investigation to be false alarms. But nevertheless it is most important to have such reports, that investigation may take place. In many instances those reports have enabled the inspector to reach the physician attending the case, who had been remiss in reporting as the law requires. The Health Inspector who has charge of this work, no matter from what source the information comes, at once visits the house where the disease exists. He ascertains if the disease had occurred there. He notifies the inhabitants on either

sides of the house, also the nearest grocer or butcher. This procedure, perhaps, accomplishes all that could be gained by placarding the house. The inspector ascertains whether the family has any book from the Public Library, and if so, the Secretary is notified, who has orders not to receive any book from the house without a medical certificate that it is free of infection. In cases of diphtheria and typhoid fever, the house and premises are inspected, so that any sanitary evil may be abated.

All of which is respectfully submitted.

WM. CANNIFF,
Medical Health Officer.

TOWNS.

BRAMPTON.

Secretary's Report.

I learn from our Sanitary Inspector's report—we have no Medical Health Officer—that the sanitary condition of our town is good, and that it has been well attended to during the year. No serious nuisances have been complained of, nor have we had many cases of infectious or contagious disease.

CHATHAM.

Chairman's Report.

In conformity with the statutes defining the duties of the Chairman of a Local Board of Health, I hereby briefly bring before your honourable body a synopsis of what has been effectually carried out by the Board during the year ending October, 1886, and some few suggestions for the near future.

It must be very gratifying to your honourable body to learn that the health of the town has been comparatively better since my last report than what it had previously been.

The mortuary returns show a death-rate of about 15 per 1,000; Chatham returning a lower average than 15 out of the 19 cities and towns in the Dominion, compiling statistics in this way. This is in a great measure, no doubt, due to the efforts of the Board of Health, and the effects of carrying out of sanitary measures and precautions through your very efficient and able officer the Sanitary Inspector, who has, for the year just closed, attended promptly to having all water-closets, pig-pens, wells, cellars, and manure pits cleaned out where their condition demanded it for the safety and preservation of the public health. He also keeps a strict record and proper supervision over all milk vendors. The latter is all the more essentially necessary, when we consider in how many instances the germs of disease are carried in milk.

We have had reported this year ninety-three cases of contagious diseases by the town physicians, (who report willingly and cheerfully to the Inspector direct), and as several cases very often occur in the same family, the points of contagion would not be more than, say forty families; of these a very small percentage were fatal, showing that we have had no one form of disease spreading, as bad forms of epidemics usually do, to complete their fatal work.

You will no doubt remember a scavenging by-law was prepared by the Local Board of Health, and passed by your Honourable Body early in the season. The writer is happy to be able to report favourably upon the working of the same. What was hitherto a most hideous, loathesome and nauseous process at night, is now odorless and inoffensive to the health of the town and executed in the daytime. Sleep, before the passing of this by-law, prevented the olfactory nerve from rebelling at its non-removal, and consequently allowed many an inhabitant to innocently inhale these noxious gases from night-soil that are now rendered innocuous by disinfection.

As malarial diseases are among the most prevalent forms of diseases in our town, and as the cause of the above is beyond dispute the decomposition of vegetable matter, heat and moisture being necessary thereto, the Board of Health hail with delight the amount of drainage introduced by the present Board of Works. May I here suggest, that in my opinion all drains should be properly trapped at all uprights, thereby preventing a wholesale poisoning of those in the vicinity of the uprights by noxious and poisonous gases generated in said drains. These traps can be put in at less cost when the drain is being constructed than at any time afterwards, and fully carry out an old and true adage, "What is worth doing at all is worth doing well."

Healthy as our town is, it can, no doubt, be very materially improved by a properly established system of water supply. The present source is very defective, allowing by soakage the germs of disease from our privy-pits and sewage to contaminate the very water we are daily consuming. To obviate this somewhat, the Board took advantage of Clauses 14 and 15 of the Act compelling all persons building new closets or replacing defunct ones to make the new ones water-tight, pits underground or dry-earth closets. These permits are obtained from the Medical Health Officer (Dr. Hall) at his office. About thirty of these have been granted during the summer.

As to the best means of water supply it is a moot question at present. The filtering of the waters of the Thames, I think, would be an injudicious experiment, as to cost probably not less than by bringing purer water from the Chenal Ecarte, it is doubtful whether or not by a filtering process (which is apt to be run and managed improperly, by reason of a too unfrequent removal of the filtering medium used), the disease germs could be removed so as to be compatible with health, which the Thames water is alive with, containing as it does the sewage of London and several small places below it; also any abundance of decaying vegetable and annual matter from other sources. If this were possible in summer it would not be so in winter, when the river is frozen over and not exposed to the oxidizing effects of the atmosphere.

I think, of the comparative merits of the waters of Lake Erie and river Chenal Ecarte, the saving in cost of construction and after maintenance would be in favour of the latter source, owing to the distance that clear water is reliably and continually found from shore, and difficulty in keeping a crib in the lake so far out.

As to Artesian wells I may say, that for supplying each private family by such a well, I think the scheme, if pretty universally adopted, would nearly approach to a more perfect system of water supply.

Councillor Malcolmson, Mr. Andrews, an expert from New York City, and the writer, spent considerable time in visiting the most noted flowing wells in Raleigh Township, and gathering information from all other possible sources at our command on the subject, with the result of receiving an adverse opinion from Mr. Andrews on the feasibility of a scheme of supplying Chatham with a system of connecting a gang of artesian wells, as in vogue at present in the cities of Albany and Brooklyn.

As Chatham would require nearly one million gallons per diem, Mr. Andrews stated that unless some convenient point could be found in or about Chatham, with from at least two or three feet of coarse gravel immediately over the rock, that the supply would not be sufficient, or if sufficient, if taken from a quick sand layer over the rock would yield riley and dirty water, under his or any other system of pumping by steam power, and consequently be unfit for drinking purposes, and soon choke up the conduit pipes.

Although water may look pure and clear and be palatable, yet it may contain the germs of typhoid fever, diarrhoea and other diseases; hence the importance of having the source or sources of our water supply above suspicion; and more particularly would I

like to see the town, through your Honourable Body, set apart an appropriation sufficiently adequate to procure a comprehensive report, in detail, from some competent engineer as to best source, cost of construction and maintenance of same.

I venture to say that, without burdening the people beyond their ability and willingness, the same could be made self-sustaining, and the people would be benefited at the expense of sickness, death and the doctors, and would have all the immunity from contagious diseases that such a system of good and pure water supply could alone give them. Just think of 200 tons of excreta and sewage, worth \$30 per ton, if used for fertilizing purposes, being allowed to percolate the porous soil of Chatham every year, to contaminate our wells and our present drinking water supply.

Hoping you may see your way clear to take some action to remedy this evil by giving it your undivided attention and support,

JAMES P. RUTHERFORD, M.D.,
Chairman, Board of Health.

GALT.

Medical Health Officer's Report.

As Medical Health Officer for the town of Galt I have to congratulate you on the sanitary conditions of the town in general. It is a matter of thankfulness that during the past year our town has not been visited by any wide-spread cause of mortality or sickness, beyond the ordinary causes that are at work from year to year, over which we have little or no control. In comparing our statistical standing with other towns of similar population we stand third on the list, our death-rate being sixteen per thousand. Of the *ninety-five* deaths occurring in the past year—under 5 years, 32; from 5 to 20 years, 9; from 20 to 40 years, 18; from 40 to 60 years, 15; and over 60 years, 21; showing a very large number, nearly one-quarter, that arrived at a good old age.

The report of the chairman of the Board of Health embraces about all the information as regards the number of cases of typhoid fever and diphtheria we have had reported during the year, eighteen of the former and thirty-eight of the latter; but this, I am sorry to say, does not embrace all, as many cases have not been reported. There was no deaths from typhoid fever, and only three from diphtheria, showing, I think, in a measure that neither have been of a very malignant type.

It is a matter of regret that the town is not in a position to adopt a system of water-works and drainage, as nature has done so much to assist us in getting rid of a great deal of effete matter by means of the river, which might, with small cost, be made to run much more rapidly than it now does, and thus keep a steady current and no stagnant water.

General vaccination was so thorough last year that there were but few left for this season, and these, I think, have all been attended to.

I would strongly urge the council to purchase a lot now when there is no excitement about smallpox, for the purpose of erecting a hospital thereon, and be ready in case of an outbreak.

All of which is respectfully submitted.

G. P. SYLVESTER, M.D.,
Medical Health Officer.

HARRISTON.

Secretary's Report.

He replies to a circular issued by the Provincial Board of Health some months ago regarding the prevalence of diphtheria in many parts of the province, instead of making his annual report of the proceedings of his board.

KINCARDINE.

Medical Health Officer's Report.

There have been no cases of contagious diseases during the year The general health is good.

LINDSAY.

Medical Health Officer's Report.

In accordance with the requirements of the Public Health Act of 1884, section 24, I beg herewith to submit my second annual report on the sanitary condition of the town of Lindsay, and such other matters as I think interesting and important in regard to public health and public requirements in this direction.

I am pleased to report that during the year a number of questions affecting the health of this municipality have engaged the attention of your Board, and in every instance a live interest has been evinced. I have only to regret that The Public Health Acts do not provide that independence of action necessary to carry out your wishes. Your Board, in one particular at least—the outlay of public money is simply recommendatory to the municipal authorities and depends entirely on their good will for this *pabulum vite*,—is handicapped, and until some change is made by Provincial enactment your Board, in common with others throughout the country, must remain at a serious disadvantage. Fully realizing this as your representative at the inaugural meeting of the Provincial Executive Association of Health Officers, I proposed as first question for consideration such reconstruction and emendation as would make your duties more certain, powers more decided, the control of necessary funds within your authority, and as a consequence the securing to the public the full benefit of such measures as, in your judgment, were needed for the public good. It cannot be expected that municipal corporations, no matter how well intent, should give that careful consideration to sanitary matters as Boards of Health appointed for that purpose, therefore will not in all cases sympathize fully in your views—certainly not when such kindness of feeling shall mean an outlay of municipal funds. The local Boards of Health should be entirely independent, quite as much so in every particular as boards of education. If made elective by the popular vote and directly responsible to the people, any danger of undue extravagance would be obviated, a great saving of human life and lessening of suffering secured, fully warranting any necessary outlay and securing a very fair return for the money invested.

This will be the more plain to you by referring to the British Registrar-General's report. During ten years covered by that report 2,777,584 years of life has been given, and some 41,655,760 years of suffering prevented for the money expended in sanitary improvements in that country. In Birmingham, notwithstanding that the population has increased one-fifth, from 41 to 51 persons to the acre, the deaths have decreased from 8,594 in 1887 to 8,156 in 1885, shewing an actual saving in three years of 17,715 lives, and a secured money value, according to the Registrar-General's estimate, of £2,816,685. Nearer home we find by the Registrar-General's report for Ontario a reduced rate of mortality, representing also a money value as a return for the cash invested for health purposes. I need not quote further to impress upon your Board and the municipal council as well, that your calls on the treasury is really money well spent, yielding a fair dividend in an improvement of public health and the relief of suffering.

Not only were you met at the outset with this discouragement, but you have learned in the discharge of your duties that the public had to be educated in the very rudiments of sanitary requirements; your every act met with opposition often in quarters least expected. Early in the season cases of suspicious sore throat made their appearance within the corporation. Your medical health officer reported danger of an epidemic of diphtheria, and recommended strict enforcement of those sections of The Public Health Act relating

to contagious and communicable diseases, the placarding of infected houses, strict isolation, fumigation, disinfection, and other precautionary and restrictive measures; 1,000 copies of the pamphlet "How to Prevent the Spread of Infectious and Contagious Diseases," issued by the Provincial Board were distributed, and notwithstanding your efforts to instruct, every conceivable evasion was resorted to to deceive and mislead, until the disease had assumed such proportions that further concealment was impossible; the judicious distribution of a number of printed questions in the form of a circular hastened this *dénouement*, and as a result we learned that there had actually been sixty-four cases distinctly diphtheritic with thirteen deaths, and in the majority of cases householders and physicians had been remiss in their duty of reporting to your medical officer. Houses were not placarded, isolation not insisted upon, and disinfection altogether neglected or carelessly performed. By means of these circulars we learned as well, that cellar drains were not as a rule trapped, ventilating pipes a *rara avis*, dry-earth closets, rendered obligatory by state and municipal enactment, not generally in use, that unplacarded houses permitting free intercourse were in the majority of cases charged with having disseminated the contagion; that in no single instance did the disease appear *de novo* in dwellings properly drained, and in which the dry-earth was used. In every such case where it occurred personal communication was attributed as cause, and in no dwelling sanitarily perfect, where ordinary precautions were observed, did the disease extend to a second member of the family. One apparent exception to this occurred, which is perhaps worthy of mention as teaching a salutary lesson. In this dwelling every care it was supposed had been exercised both before and after the appearance of the disease, and a great deal of money expended to make it thoroughly healthy. An examination, however, revealed the fact that an untrapped drain connecting with the public sewer opened into the cellar, and its foul gases thus freely liberated spread throughout the house, favouring the communication of the disease to other members of the family. I am pleased to report that on the extent of this epidemic becoming known, and the requirements of The Public Health Act strictly enforced, *no new cases occurred* and the disease was quickly eradicated. The fact that the disease had already reached grave proportions and rapidly increasing in severity, to be immediately snuffed out, untold lives removed from jeopardy and deaths prevented, is proof indeed of the value of your services.

Your medical health officer believes that in Ontario, if not throughout the Dominion and Christendom, the rule holds good that drainage in cities and towns is very faulty, and as a consequence there is increased rate of mortality with density of population. There are few places more unfortunate in this respect than the town of Lindsay. We know the construction of our main sewer to have been defective from the first; that it is of no practical use for drainage purposes; that as a matter of fact, from error of construction, the incline is from near the centre to opposite ends, with only possible outlet at one; that a certain amount of filth necessarily remains at the further extremity from the outlet, receiving constant additions to ferment, decompose, and give off its poisonous gases continually; that a large number of cellar connections are square wooden contrivances with no excuse for trapping, if such were indeed possible; that the only means of ventilating is through surface openings on the public thoroughfare and cellar openings, which syphon the air redolent of vile smells and disease-provoking germs into the houses; and this reprehensible state of affairs is allowed to continue, notwithstanding the fact that, as guardians of the public health, you have recommended corrective measures; that an efficient system of sewerage has been submitted by the secretary of the Provincial Board and endorsed by a distinguished engineer; and despite your reiterated recommendations and protestations, I am afraid that the season for action has almost past, and that severe weather approaching will give excuse for further delay, leaving this pest hole to continue belching its noxious gases into our nostrils and lungs as we walk our principal street or enter the places of business on either side. To remedy this as far as practicable, your medical health officer had the sewer thoroughly fumigated with sulphurous acid gas, vaporising some 200 pounds of sulphur, and used as well a quantity of soluble phenyle and sulphate of iron largely diluted with water, this *modus operandi* to be repeated at such times as may be necessary until efficient sewerage ventilating shafts and stench traps are secured. As the importance of this procedure has been questioned, I may tel

you that sewage is said to contain about 15 parts of organic matter to the 10,000, and that even in a quiescent state it evolves some 30 cubic inches of deleterious gas to the gallon ; and this not the evolution of a day only, but of weeks and months, as decomposition continues and new matter is added to undergo like change.

Your medical health officer has recommended the use of intelligence cards by the school board, similar to those in use in the city of Hamilton, and introduced there on the recommendation of the medical men of that place. It is only by some such means we can hope to receive early notification of the presence of communicable and infectious disease, and reach that class who do not in supposed trivial cases employ a physician, and who, unfortunately, are often the first to be attacked. These cards would as well prove a check on householders and physicians, who, in some cases, are inclined to evade the law.

The question of the quality of water being used throughout the town for drinking purposes has been also discussed by you, as well as the best plan of uniform water supply ; to do away with wells altogether, which, under most favorable conditions, are liable to contamination.

As to water supply, your committee appointed to enquire find, that in the western portion of the town there are a number of very good wells, the water pure and cold ; the better water was taken, as a rule, from very deep wells. Your committee conversed with a number of householders, and learned that the water came into the wells the more freely and of better quality the deeper they had been made ; in some cases it rushed in so rapidly and filled the well so quickly that the diggers could scarcely escape. On the strength of this evidence your committee were of the opinion that this section of the town was plentifully supplied with springs of very excellent water. To decide, however, on the quantity that could be secured, it would be necessary to bore to a greater depth than the deepest wells. They think such procedure warranted them to decide the question of quantity that could be depended upon. The ground in this locality is above the tallest chimney on Kent street, and if supply proved sufficient could very easily be conveyed to the town for drinking and fire purposes.

Your medical health officer regrets to inform you that in cellars throughout the town there appears to be a great number of open cisterns, mostly large wooden tanks. These are very objectionable, and their continued use should be depreciated by your board.

During the past few years our schools had received little attention by way of repair, and had reached a stage of dilapidation, neglect and filth, in a high degree detrimental to the health and comfort of the pupils. I am gratified to report that suggestions offered for their reconstruction and sanitary improvement have been acted upon, and that to-day they are in every way equal to those of any other town in the province, and deserving of extended support.

In a paper read at the East Victoria Teachers' Convention, your medical health officer advocated the appointment of a Provincial sanitary officer, "whose duty it would be "to enquire into existing greivences that interfere with the robust physical growth "of our scholars ; to visit all sections and schools in which there may be complaint ; "see that district inspectors and trustee boards are fully alive to hygienic and sanitary "requirements, and that they are practically carried out ; that in fact nothing should be "wanting from lack of intelligence or remissness of duty to interfere or in any degree "retard true symmetrical development." Certainly, an improvement on our present system should be inaugurated. Whatever may be the duties of school inspectors, boards of education or teachers, as laid down by official regulations, the result shews unwarranted and inexcusable neglect. I do not think that our local officials have been in any degree more culpably remiss than their confreres throughout the Province ; but I do contend that the neglected state into which the schools of this town had been reduced, the dilapidated appearance of schools, outbuildings and grounds, as they exist throughout country districts at the present, satisfies me that the machinery is defective. Either stated fees should be allowed present officers to stimulate their zeal, or some such official as I propose appointed to authoratively persuade them. We cannot expect a healthy man and womanhood and grossly outrage the laws of health during the tender and susceptible years of life. When we consider the many hours of confinement to which scholars are subjected, too often in close, foul-smelling, ill-lighted, poorly-ventilated, dusty, dirty rooms, we realize the importance of

a radical change. No matter how high vaunted or popular such a system of education may be, I consider it a veritable fraud if sanitary laws are not practically incorporated. The school-house should be a home, its surroundings cheerful, clean, tidy; and a sound, useful education given to every child at the public expense. The result of teachers' conventions and the councils of inspectors who would appear the chief parties consulted, has been to elaborate and extend out of all reasonable proportions and requirements; and while it encourages a mental "cram," neglects the just equipoise of mental and physical growth. Physicians experience the results of this one-sided training in the ill-nourished, nervous, sickly and complaining children whom they are constantly called upon to attend. Is it not quite time that a halt was made and a more rational system introduced? The Kindergarten is a step in the right direction; instruction in useful trades and occupations should follow, as well as distinctly female schools, encouraging correct deportment, calisthenic exercises, and branches useful in the household duties of after life. Physical and mental growth should go hand-in-hand assisting, and not conflicting and overpowering each other; they should develop simultaneously, and any system of education not based on this principle is a failure.

In closing this report, I would mention that during the year I have had the cheerful assistance of your sanitary officer, and much of the work accomplished is due to his commendable attention to orders. I have also to express my gratitude for the kind manner in which your Board has received such suggestions as I have felt called upon to submit, and hope that another year will find, as accomplished facts, the changes and measures now recommended by you, when I am confident the public health will be the better protected, and increased immunity from disease and decreased death-rate secured.

P. PALMER BURROWS,
Medical Health Officer.

NAPANEE.

Medical Health Officer's Report.

In the month of August last we were visited by diphtheria in a very malignant form in the person of a young man named Hambly, and the remaining six children of the family received the infection. Five out of the seven died. The disease was strictly confined to the one house, which was isolated and afterwards thoroughly disinfected and fumigated. The cause cannot be definitely discovered, although there are surmises that the well water may have been polluted by sewage, the house being built on sandy soil and favoring this probability. And again, the too close proximity of the graveyard to the Hambly residence may have had something to do with it. We closed a cheese factory that was receiving milk from the Hambly farm. No further cases occurred, and the Board deserves the thanks of the people for preventing the spread of this disease. Nuisances have been attended to promptly when complained of. The cheese factory above alluded to having only been closed for a time and ordered to clean up, is again running, and requires the attention of the Board, which I have no doubt it will receive.

NIAGARA FALLS.

Secretary's Report.

Only two cases of scarlet fever, two of typhoid, and one of whooping-cough of an infectious nature, have occurred during the year. Slaughter-houses in the municipality are prohibited by by-law. The sanitary inspector, under instructions from the Board, exercises a strict guard over causes which, if neglected, might lead to unsanitary conditions. The town is in a good sanitary condition, and the law relating to public health will be enforced in order that this beneficial condition may remain.

ORILLIA.

Medical Health Officer's Report.

In compliance with the requirements of the Public Health Act, I beg to submit the following report of the sanitary condition of the Town of Orillia for the current year. It was a matter for congratulation that up to the end of the first half of the year the town was in a remarkably healthy condition, there being no epidemics or wide-spread cause of sickness or mortality. I regret, however, to have to report a much less favourable state of things in the last half of the year. In addition to the usual number of ordinary cases which we generally find prevalent during the summer and autumn months, such as diarrhoea, dysentery, cholera infantum, etc., we have had a number of cases of a more serious nature. In the month of August three cases of diphtheria occurred in a house on the corner of West and Coldwater streets, one of which proved fatal. On enquiry it was found that the disease had been propagated at Uxbridge, where the patient, a boy of seven years, had been visiting. The symptoms developed immediately on his return home, and the disease was communicated to the other children in the family before its true nature was discovered. The usual precautions were taken to prevent the spread of the disease, and I am happy to be able to say they were successful, no other cases having appeared in the town. I may remark that this is the first time diphtheria appeared in Orillia for several years past. This year, as last, there have been a number of cases of scarlet fever of a very mild type, occurring sporadically and showing no disposition to spread, in many instances not even among members of the same family. The cases, however, were sufficiently well marked in the characteristic symptoms to place the diagnoses beyond doubt. Whooping-cough has been prevalent in the town during the autumn months. A large number of cases have been complicated with pneumonic fever. The outbreak so rapidly assumed a general epidemic form that any attempts at isolation were thought to be useless, and very few children in the town who were unprotected by a previous attack have escaped. The disease in uncomplicated cases cannot be said to be of a very serious type; indeed, in most instances, they show a disposition to yield more readily than general to treatment, and the attack is much shorter in duration than usual. Several deaths have occurred in very young subjects, but in every instance the disease was complicated with congestion of the lungs or convulsions. I regret to have to report a large number of cases of typhoid fever, occurring during the latter part of the summer and autumn. Last year we had eighteen cases and four deaths; this year we have had seventeen cases and one death. This is a record which, as citizens of Orillia, we ought to feel ashamed of, when we reflect that of all preventable diseases, perhaps none are more so than typhoid fever. Nearly all the cases appeared in the south and south-eastern part of the town, and there can be but one opinion as to how they were propagated. In my report both last year and the year before, I pointed out the unhealthy condition of that part of the town, and ventured to predict that fevers would be an annual occurrence so long as the sanitary condition remained unimproved by more thorough and efficient drainage. In addition to the usual sources of fever in the district I have mentioned, the unsanitary conditions have been very greatly augmented this year by what is known as the West street drain. This drain, which had been cut for about half a mile through the swamp, as far as the Midland Railway, had no outlet to Lake Couchiching in consequence of the railway company neglecting to construct a culvert, consequently it was filled during the whole summer with stagnant water covered with a green scum, and emitting foul and noxious odours. It is not surprising that a number of the cases of typhoid were in close proximity to the drain. I am happy to be able to report, however, that both the Grant Trunk and Northern Railway Companies have quite recently had excellent culverts constructed through their respective roads,—culverts of sufficient capacity to allow a rapid passage for all the water likely to accumulate in the drain, even in flood-time. This fruitful source of disease has therefore been removed. The inspector reported to me, during the summer, a large number of wells in a dirty condition, samples of water from a number of which he brought to me for examination. The usual test showed a large quantity of organic matter in each, and I gave orders to have them properly cleaned. I have to

remark, however, that no matter how thoroughly the cleaning may be, the improvement to the water supply is only very partial and temporary, as, owing either to the constant addition of surface water or the close proximity of the wells to cesspools and privy vaults, pollution is unavoidable. It affords me pleasure to be able to congratulate the Board on the fact of the council having at last elaborated a scheme by which a very large additional number of our inhabitants will be supplied with that blessing which many of us have been enjoying for some years past, viz.: a bountiful supply of the purest spring water. It seems almost needless for me to remark, at this time of day, that sanitarians, the whole medical profession, and every sensible thinking man in this enlightened age, are unanimous in the opinion that of all the conditions which conduce to the health of a community, none are more indispensable than a supply of pure water; and, on the contrary, of all the conditions which are conducive to the propagation of disease, none are more potent or fruitful than impure water. Therefore, no expense should be spared in supplying the whole community with so indispensable a requisite. I need scarcely say that the scheme shall have my hearty support, and I sincerely trust that nothing will prevent its being carried into effect as soon as the spring opens. The condition of the esplanade continues to be, as it has been during the past ten or twelve years, the cause of frequent complaints. The large quantity of decaying vegetable matter, together with numerous holes filled with stagnant water, are the source of foul and disgusting emanations, which, doubtless, largely contribute to the unhealthfulness of that part of the town. The railway company have been so frequently appealed to in vain in regard to this matter, that it seems useless to make any further attempts unless it might be in the direction of a lawsuit. I would suggest to the Board that the matter should, at as early a date as possible, be laid before the Provincial Board of Health, so as, if possible, to secure something being done in the direction of improvement as soon as the spring opens. I regret to have to report that much less sanitary work has been carried out throughout the town this year than either of the two previous years. This is owing to the dismissal of the sanitary inspector at the beginning of the year, and the adding of his duties to the already numerous duties of Mr. Sparling. It was quite impossible for that official, owing to the multiplicity of other engagements pressing upon him, to give the attention to sanitary inspection which the duties of that office demanded. The house to house inspection was therefore very partial and incomplete. Your chairman very wisely and properly engaged the services of Mr. Dreyer as assistant inspector for a couple of weeks in midsummer, but although he did an excellent work for that short period, it was altogether insufficient to meet the requirements of the town. I append hereto a synopsis of his report, from which it will be seen that the town is in anything but a good sanitary condition. I think it a great pity that the council thought it necessary in the interest of economy to dispense with the services of an inspector who could devote the whole of his time during at least three or four months of the summer to sanitary work. Without such an official the work of the Board must necessarily fall very far short of the requirements of the statute, and the public health must suffer in consequence. I beg to quote the following paragraph from the report of the Provincial Board of Health, which exactly hits the mark: "The appointment of sanitary inspectors can be considered only second in importance to medical health officers. It is quite obvious that no sanitary system, however well it may be planned, will be of practical service unless its provisions are carried out; and there must be some person to carry into execution the orders of the medical health officer and the provisions of the sanitary acts and by-laws. Such executive works it should be the duty of the sanitary inspector to perform, as well as to see what abuses or unsanitary conditions exist, and report them to the medical health officer when necessary. His work, to be effective, must be constant, unremitting and systematic. It is a work which, bringing him often into antagonism with individual ignorance, personal neglect and private interests, must of necessity, here and there, initiate and create a hostility towards him personally, as the officer is too frequently confounded with the office; hence—requiring tact, intelligence, and character, the work ought never to be delegated to any person not possessing these qualities, and any one possessing them deserves and will require to be properly paid." I had the privilege of attending the annual meeting of the American Health Association, held in the city of Toronto in October last, and I have to

thank the council for kindly re-embursing the expenses necessarily incurred. The meeting was a very important and interesting one, and very numerously attended by delegates and members from all the States in the American Union, and many of the towns and cities of this province, many of them being among the foremost sanitarians of the day. The various papers read were of a most interesting and instructive nature. The principal subject which engaged the attention of the convention was the disposal of sewage in cities, and the better methods for the removal as well as disposal of excreta and refuse in towns and villages. The unanimous opinion was in favour of crematories. Several of our own cities have already introduced them, and others are moving in that direction. It may be premature to speak of a crematory in Orillia at the present time, but certainly the time has arrived for introducing some better system, for portions of the town at least, than that which at present prevails, viz., the cesspool and privy pit. I have in former reports urged upon the council the necessity for the passage of a by-law abolishing privy pits on the main street at least, and the introduction of dry earth closets instead, but so far my efforts have been unavailing. I am fully convinced that if the importance of the matter was better understood and more fully realized by those in whose power the matter lies, we should very soon have a change. I desire, in conclusion, to point out one provision of the statute which could very easily be, but never has been, complied with. It is contained in Section 49 of the Public Health Act, 1884. Allow me to quote it verbatim: "Whenever any physician knows that any person whom he is called upon to visit is infected with smallpox, scarlet fever, dyphtheria, typhoid fever, or cholera, such physician shall, within twenty-four hours, give notice thereof to the Local Board of Health, or medical health officer, of the municipality in which such diseased person is, and in such manner as is directed by rules 2 and 3 of section 17 of schedule A." Blank forms have been provided in accordance with said rules, but they have never been used. The want of such reports has entailed a considerable additional trouble upon me in framing my annual reports. Synopsis of assistant inspector's report: No. of houses visited, 321; No. of houses re-visited, 22; No. of cellars found damp, 7; No. of cellars requiring cleaning, 11; No. of cellars requiring ventilation, 4; No. of cellars found containing rotten vegetables, 2; No. of dry earth closets, 3; No. of privies requiring cleaning, 23; No. of dwelling houses in unclean state, 4; No. of yards in an unclean state, 15; No. of manure heaps to be removed, 6; No. of unused cisterns under dwellings, 2; No. of pumps in yards not used, 6; No. of wells unused on account of polluted water, 10; complaints of tenants on account of bad well water, 4; samples of water tested and found bad, 6; No. of families using water from wells three feet deep, 12; No. of stables in a stinking condition on account of dead animals lying unburied, 2. This report was adopted at a special meeting of the council on Friday evening.

E. S. ELLIOTT, M.D.,
Medical Health Officer.

PARIS.

Medical Health Officer's Report.

I hope the time is not far distant when no new privy pits will be dug, and all the old ones replaced by a substantial ash closet. When this matter is well attended to, and the stagnant ponds done away with, the labours of the Board will be reduced to a minimum. The people want to show more interest than they have hitherto done in sanitary matters; but, notwithstanding their apathy in this respect, our town will compare favourably with other places in cleanliness and healthfulness. Very few cases of infectious disease have occurred during the year, and when people devote more attention to excreta removal, there will be still less.

W. BURT,
Medical Health Officer.

PETERBOROUGH.

Medical Health Officer's Report.

In presenting the third annual report of the Medical Health Officer, I would congratulate you on the freedom of the town during the past year from epidemic disease, on the low death-rate we have experienced, and on the increasing compliance on the part of the public with the provisions of the Health Act. While we have not been free from diseases which are due to removable causes, I believe their extent and severity have been as moderate as any town in the province, and have been considerably limited by the sanitary precautions that have been used. I will refer as briefly as possible to the various points that demand our attention.

Slaughter Houses.—These have been inspected at frequent intervals and found generally satisfactory. Complaints have been made several times about one or two, and on investigation have been found not altogether without cause. I am glad to say, however, that the owners have promised to remove them before next spring.

Hog Pens.—There has been a large decrease in the number of these since the Board commenced operations. But every year a few have been found hidden away here and there within the proscribed distance from the dwellings, in some cases giving rise to considerable trouble. If there were better and more economical ways of getting rid of kitchen refuse, there would be less temptation to keep hogs.

Removal of Garbage.—This has been more systematically attended to this year, several persons finding employment in the work. The greatest difficulty is where vegetable matter, in a state of decay, is allowed to collect. Indeed, in some places, it would require the constant presence of a sanitary inspector to keep things in order. The advantage of a public scavenger paying regular visits is apparent. In such a case refuse would be gathered up and exposed, instead of being spread out or concealed.

Disposal of Excreta.—Earth closets are gradually being substituted instead of privy vaults, and will continue to increase in number as their sanitary value is recognized. The majority of vault closets are cleaned out once a year according to law. Some are emptied several times a season, the excreta being used for fertilizing purposes principally. The old prejudice against this is wearing away. It will be necessary next spring to provide a nuisance ground, as the old one has not been available of late.

Wells.—I have examined many samples of well water this season, and am glad to say that there is a marked decrease in the amount of organic matter present. This is no doubt due to the greater cleanliness above ground, filth and rubbish being removed before the surface becomes saturated. Another cause in some cases is the yearly cleansing which the law requires. But I am of opinion that many wells are used from year to year without annual purification, or the work is done in a perfunctory manner to evade inspection. Where wells have been found highly impure they have been closed up.

Complaints.—A large number of complaints have been made during the past year. To many the duties of a health officer appears to be of the most comprehensive kind. The blowing of steam whistles or the too early crowing of fowl, are supposed to be proper questions for the investigation of the Board. Many are neighbours' quarrels, and many are just and proper complaints. Your officers have investigated and rectified these in the simplest and quietest manner possible. All that has generally been found necessary is to state the law clearly to the offending party, and there is usually very little further trouble.

Sewerage.—Most of the complaints in the centre of the town have arisen from causes which a good system of sewerage would remove. Having referred to this before, I need but say that the extension of the water-works system not only creates, by the freer use of water, a necessity for better drainage, but provides facilities for it as well. Some of the drains have required frequent charges of disinfectants to keep them in good order.

Contagious Diseases.—The principal matter to note under this head during the past year is the prevalence of diphtheria. Peterborough has not been alone in this respect, almost the whole province having suffered. A circular relating to the number of cases, their causes, their courses, best means of prevention, etc., was filled out at the request of

the Provincial Board, and with others formed the basis of a paper read by the Secretary of the Provincial Board at the meeting of the American Public Health Association in Toronto, last October, which, I regret, I was not able to attend. The number of cases in town throughout the year, as nearly as can be ascertained, is about seventy-five, twenty-two houses having been placarded. Among these there were only eight deaths, all of them being children. I believe bad water and bad drainage to be the principal causes. In a thinly settled town, where the lots are large and admit of a good distance between well and privy vault there may be no danger; but as the town fills up and the lots become smaller and houses more crowded, and in consequence the well and closet are apt to be in dangerous proximity, there is great danger. Unless earth closets are generally used this will be attended with considerable risk, and to avoid it I should strongly recommend boiling or filtering all water for drinking purposes. An instance may be given of the perils of impure water. Diphtheria broke out in a family. Everything appeared to be in good order and no cause could be at first assigned. On closer examination it was found that the kitchen slop-pipe connecting with the waste pipe from the well had rusted through, thereby allowing the contents of the former to trickle down alongside of the pump. As it was impossible to determine the amount of contamination the well had to be closed. All cases cannot be traced so exactly as this. The most rigorous examination in some houses where the disease had occurred failed to detect any source of danger. But there must have been a sanitary leak somewhere, and this shows how careful families with young children should be during the prevalence of diphtheria. Wherever cases have appeared rigid isolation has been resolved upon, the other children kept from school, and when the disease has subsided the house and clothes have been disinfected with sulphur, chloride of lime or carbolic acid, under the direction of the medical attendant or the officers of the Board. Cases this year have been pretty faithfully reported. I am glad to say that at present the disease appears to be dying out.

Typhoid Fever.—There have been fewer cases of this disease during the past year than for some years previous. Sanitary measures are evidently beginning to have their effect. Two deaths have occurred from typhoid and one from typho-malarial fever.

Scarlet Fever.—There have been a few cases, but fortunately no deaths.

Mortuary Statistics.—In 1885 the Dominion Government included Peterborough among the towns in which mortuary statistics are collected. We thus know the exact death rate of the town, which was 18.46 per thousand last year. When we consider that 17 per thousand was fixed upon by the Registrar-General of England as a standard to be aimed at by sanitarians, we may congratulate ourselves on exceeding it so little. During the same year the ratio in the city of Toronto was 20.61 per thousand.

A Benefit.—On the whole, I think we can look back on the two or three years since Boards of Health were inaugurated with considerable satisfaction. To be sure, we have had no large municipal measures put in operation, but there has been a vast deal of individual work, and without this all municipal measures would be useless. It has been said that few places will pay any attention to health considerations until the fear of death is staring them in the face. I am glad to be able to say that this state of affairs is rapidly passing away in Peterborough. The public sensibilities have been sharpened, and as this process goes on a firmer demand will arise for those more important measures of sanitary reform which will prove an inestimable boon to the town, and assist in no small degree the operations of the Board.

J. CLARKE, M.D.,
Medical Health Officer.

PICTON.

Medical Health Officer's Report.

Although the death-rate in our town (17.3) has been very small during the past year, yet the amount of sickness prevailing has been far too large in a place which, with little effort, could be made one of the healthiest spots in Canada. The marsh at the head of the bay, together with other stagnant water patches, is the cause of nearly all the

trouble in the matter of diphtheria, typhoid and other preventable diseases. Diphtheria was in five houses during the year, resulting in six cases and two deaths. Four of the houses were quarantined and thoroughly disinfected; and in stringently carrying out isolation, etc., we had the satisfaction of stamping out the disease. Prompt action has been taken in the few cases of nuisances complained of. Considering that sanitary work is in its infancy in Picton, we have good reason to congratulate ourselves on its progress, and I have no doubt but that in a short time we will be in a position to state that we have surmounted all difficulties in the way of carrying to a successful issue every needed sanitary reform at present contemplated.

PORT ARTHUR.

Medical Health Officer's Report.

Some of the water used by the inhabitants has been proved by analysis to contain matter injurious to the health of the public. This water is that taken from the creek. The water ought to be entirely taken from the bay, as it has been proved to be comparatively pure. This drinking of bad water is the cause of many of the zymotic diseases which have been reported during the year. Negotiations are being made to have a system of drainage adopted for the town which, if properly carried out under the auspices of the Board, will have great influence for good in public health matters. The slaughter-houses have been kept in a sanitary condition, and the streets, lanes, and yards have been kept clean. During the year we have had forty-six cases of diphtheria and seven deaths; four cases of scarlet fever, none of them being fatal, and ten cases of measles. These diseases are attributed to the large amount of rainfall which was allowed to lay in flat places on the ground and become stagnant through inefficient drainage.

SARNIA.

Secretary's Report.

The diseases prevailing here during the past year were typhoid, diphtheria, measles and whooping-cough, none of them being serious, so that the health of the town is in a comparatively good condition. All unsanitary conditions were closely looked after and remedied. The water has been considerably improved by extending the suction pipe further into the river, and drainage has been improved by a main sewer which is in process of construction.

SEAFORTH.

Chairman's Report.

We have had a few cases of diphtheria and scarlet fever early in the year, but they were not allowed to become epidemic, precautionary and successful measures having been adopted early for the prevention of their spread. Five cases of typhoid fever occurred early in the spring, the attack being due to exposure in other places either to the disease itself or to the unsanitary conditions which are the causes of such disease. No deaths. I am confident that the early and efficient attention paid to sanitary matters in the beginning of the year by the Board has been the means of keeping our town comparatively free from infectious or contagious diseases. I believe the sanitary inspector did his work well, and am glad to note that a large number of the people cheerfully complied with his instructions and obeyed the law. It is only through careful and thorough inspection of everything which might tend to an unsanitary condition being made that we can hope to become impregnable, as it were, against the inroad of disease. We want to keep up, and, if possible, increase the reputation Seaforth now has of being one of the most healthy towns in Ontario.

STRATHROY.

Medical Health Officer's Report.

In compliance with the provisions of the Public Health Act, I present my report on the sanitary condition of the town. It is gratifying to be able to state that this place has been in a fairly healthy condition during the year. There is an improvement on the previous years, particularly as regards typhoid and malarial fevers, very few cases having occurred, and those were of a comparatively mild type. Of late there has been some scattering cases of measles, light in character, and uniformly resulting in recovery. So far as I know, no cases of scarlet fever have been reported. There was only one death from diphtheria, that disease not having prevailed to any extent, every precaution being used to prevent its spreading. The town during the months of April and May underwent a thorough cleansing. A from house-to-house inspection was made (some four or five hundred in all) by the sanitary inspector, who, being a man of determination of character, performed his duties, uninviting and disagreeable enough though they were at times, to the satisfaction of the public generally. The arrangements made by the Board of Health were of such a systematic nature that the whole work was completed early in May. Although the best possible plan for the disposal of the night soil was adopted, still some complaints were made by those in the vicinity of where it was deposited. It would be well in the near future to take into consideration the matter of the disposal of the refuse and garbage of the town, as the by-law is very strict in regard to such deposits being made where it would endanger the public health. It is unnecessary to take up space to point out the various ways in which such deposits may cause sickness and disease.

The plan adopted in many of the large towns and cities in this country at present, is to have a furnace in which to consume the organic substances. The cost to meet the requirements of a town of this size would not be very great in comparison with the benefits derived from the destruction of matter which, when left to decompose, would be so prejudicial to the public health. There ought, at least, to be a piece of ground purchased or rented for the purpose sufficiently removed from any dwelling, so as not to be considered a nuisance. The water in the wells of some of the principal hotels was tested, and those considered impure were ordered to be cleansed. It would be advisable for the Board to consider whether those who sell milk and keep it for general use supply their cows with good water, as the stream running through the place cannot be of very pure quality from the various contents that are thrown into it at all seasons of the year. Some complaints have been made against the slaughter houses; that matter will demand attention to ascertain if they are kept and situated in accordance with the Health Act. The Board of Health have, during the past year, done what they reasonably could to improve the sanitary condition of the town, endeavouring to place it on as healthy a basis as any town or city in the country.

G. M. HENDERSON,
Medical Health Officer.

TRENTON.

Medical Health Officer's Report.

In presenting my third annual report I regret that I am unable to give definite information respecting the number of cases of contagious diseases that have occurred within the municipality since last report. None of the local medical men having notified this office of the existence of any case, save that of one family afflicted with typhoid fever.

In the early part of the summer an epidemic of measles, chiefly, if not wholly, confined to the east side of the river, visited us. The first case was a direct importation from a neighbouring city, the children of a visitor having developed measles on the second or third day after arriving. The family of the nearest neighbour and playmates of the visitors contracted the disease from, them and it soon became general in east Trenton.

A little earlier in the season scarlatina was prevalent in the neighbouring villages and county, but I am not aware that any cases occurred in the town.

The good effect of the improved drainage of the flats is observable in the absence of malarial disease during the year, and should stimulate the committee to greater efforts in the same direction.

The cases of typhoid fever have this year been all confined to the higher portions of the town, and are in most cases traceable to drinking of impure well water. With the exception of one case, the water from the wells exhibited on examination the presence of organic matter and chlorides.

As was mentioned in my first report, the soil on the hill is composed of loose drift gravel, and hence kitchen slops thrown on the surface, as well as the contents of privy vaults, readily percolate into the well through the ground. Each of the houses on both sides of the river, where the disease was found, was placed in the most favourable position, viz., on the brow of the terrae, the yard containing the well lying between the house and the stable and closet. There was thus, looking at the surface, a pretty steep incline favouring the spontaneous removal of dangerous liquids. The porous soil, however, absorbed them before they had got beyond the well, and thus contaminated the drinking water. In one case the cistern had no outlet pipe, and its overflow remaining in the cellar became a source of danger.

The lower portion of the town, being supplied with water in pipes from a source not yet contaminated with sewage, is not so likely to suffer from the inroads of disease from this cause; but the evil of allowing excreta to be deposited in shallow privy vaults, and incorporated with every foot of soil, must soon render dwelling in the flats dangerous. The employment of dry earth closets in these situations should be made compulsory as a remedy for the threatened evil.

On October 8th, a child living on the west end of Dundas street, and in the same house with others suffering from *Impetigo Contagiosa*, a contagious affection of the skin known by the appearance of the vesicles which afterwards dry into peculiar crusts, and which had been prevalent in the neighbourhood for some time and popularly denominated "chicken-pox," was found to have this eruption as well as a rash universally spread over the face, chin and chest which, by the morning of the 10th, had spread to the extremities, those on the face becoming pustular and emitting the peculiar odor of small-pox, the patient suffering from high fever and restlessness. On consultation with Dr. Day the case was diagnosed as one of severe small-pox, and the Board was advised to isolate the child and all the inmates of the House. They were removed on the same day to Baker Island Hospital where, on the following day, they were joined by Dr. H. H. Hawley, who had already done service in the epidemic at Hungerford as medical officer. A synopsis of his report is as follows:—

"I first saw the case on October 11th. It was that of a child fifteen months old. The face was well advanced in the stage of ulceration. The eruption was not so far advanced on the rest of the body. The patient was very weak, with feeble pulse, poor appetite, and other symptoms of prostration. On the 12th, a vesicle had formed on the cornea and pupil of left eye. On 14th, eruption advancing to stage of incrustation over the trunk and extremities. On 15th, the patient begins slowly to improve, the left eye still a bad feature. The case progressed favourably from this time forward. On the 27th, the quarantined family, other than that of the child, left the island after thorough disinfection and change of clothing. The house in town had in the meantime also been disinfected. The child left hospital two weeks after this date perfectly recovered, with the exception of marked opacity of the cornea of the left eye. About the source of the contagion I could obtain no information, and the parents were as much in the dark as myself."

Health Inspector Hynde reports that during the year a marked diminution in the number of pigs kept in town has taken place, as a consequence of the enforcement of the regulation as to the distance from dwellings.

The following nuisances were removed or abated, viz. :—

Pig-styes too near dwellings	15
Unclean privies	35
Unclean yards	10
Accumulations of manure	10
Polluting of streams	3
Depositing night-soil on streets	5

All of which is respectfully submitted,

CHARLES McLELLAN,
Medical Health Officer.

WALKERTON.

Medical Health Officer's Report.

The absence from any contagion, and there being no necessity for any executive action, makes it unnecessary to say anything about the sanitary condition of the municipality, which is very good.

WOODSTOCK.

Medical Health Officer's Report.

The following is the report of Dr. Ross, Medical Health Office, for Woodstock, to the Provincial Board of Health :—

Shortly after my appointment I, with the aid of other citizens, organized and brought about the holding of the Woodstock Sanitary Convention on March 30th and 31st. Besides being heartily supported by local influential men, we had with us such eminent sanitarians as Profs. Lyster and Clarke, of Detroit; Drs. Bryce and Oldright, Toronto; Arnott, London; Griffin, Brantford, and others. Although the convention was not so largely attended as expected and as it should have been, still the effects of it were seen this season, as a general cleaning-up all round was noticed. Over two-thirds of the wells in town have been cleaned out and the covers made secure against the entrance of toads, etc. Two men have been kept almost constantly employed cleaning out and filling up the old privies, after which the dry earth system was introduced. A large number of very bad privies still exist, and a by-law should be passed ordering them all to be cleaned out and filled up without delay, after which the dry earth system could be introduced. A large number of the proprietors of houses erected this year have adopted the dry earth system. After an examination of the high and common schools they were found in a good sanitary condition. The inspector and myself visited the different dairies from which the milk supply of Woodstock is obtained, and found the stables clean and well ventilated, the water supply good, and the cows healthy. After an examination of the milk (which was of a very superior quality), I issued permits for its sale up to the 1st of January, 1887. I cannot too strongly urge the speedy introduction of a supply of pure water for domestic purposes, such being an actual necessity for our town. In my opinion many, if not all, of the cases of fever we have had in the town this season can be traced to the use of polluted well water. Such a supply of water can be easily obtained and would be a paying investment for the town, both in a financial and sanitary point of view.

VILLAGES.

ALVINSTON.

Secretary's Report.

The workings of the Board in the interests of public health have been satisfactory, and the people are at all times willing to co-operate with the Board. A species of sore throat

was epidemic, but as it was not considered to be true diphtheria, the people were left to follow the advice of the attending physician. Otherwise the municipality has enjoyed the usual state of good health. Our drainage is defective, but we hope in the near future to have this remedied.

ARKONA.

Chairman's Report.

Early in the season the Board had posters distributed calling on the people to put their premises in a sanitary condition. The inspector subsequently visited all premises and found that the inhabitants had obeyed the instructions sent them, and that the village was in an excellent state of health and cleanliness. The medical Health officer verbally reported to the Board at its last meeting, that the health of the village was so good as to render a written report from him unnecessary.

AYR.

Medical Health Officer's Report.

A very careful inspection of all premises has been made, and, with some sanitary changes effected, the village is in a good sanitary condition. No outbreak of any contagious disease took place. Owing to the satisfactory state of sanitary matters generally no medical health officer was appointed.

BATH.

Medical Health Officer's Report.

In July last a case of diphtheria made its appearance, and was rapidly followed by several more of a malignant type. The members of seven families were affected, and the fatality was very great, especially amongst the young. A few adults took the disease but recovered. As soon as it made its appearance the Board instituted the most stringent remedies for checking its spread, isolation of the affected being rigidly enforced, and all made to put their premises in proper sanitary order. We had a temporary hospital erected for the reception and isolation of those becoming affected, but it was not needed to bring it into requisition, the means used having the effect of stamping out the disease. The only cause I know of is, that where the disease occurred the drainage was bad. There were twenty-seven cases and eleven deaths. This experience points strongly to the necessity of being thoroughly vigilant in looking after the sanitary conditions of our village.

BELLE RIVER.

Secretary's Report.

At the beginning of the year we were free from contagious disease. On the 11th of August, however, it was reported that there was a case of diphtheria in the village, when the Board took immediate steps for the isolation of the case and other precautions deemed necessary to prevent the disease spreading. After a short time the medical health officer reported the case recovered and the house thoroughly disinfected. No more cases occurred. This being the only case of dangerous disease in our village during the year, I think I am justified in stating that our sanitary condition is excellent, and the Board is to be congratulated for having done its duty so thoroughly.

BOBCAYGEON.

Secretary's Report.

No disease of an infectious nature visited us during the year. It was therefore unnecessary to appoint a medical health officer; but the Board stands ready for any emergency. No nuisances in existence with us.

BOLTON.

Medical Health Officer's Report.

I have the honour to state that, with the exception of a few cases of measles, the village of Bolton has been free from infectious diseases during the past year. The sanitary condition of the village is, at present, very good.

BOTHWELL.

Secretary's Report.

The Local Board has not experienced the least trouble in carrying out the provisions of the Public Health Act, as the residents have at all times shown a cordial disposition to carry out whatever orders and suggestions which the Board was called upon to make. The sanitary condition of the town and the health of the people are in a very satisfactory condition. We have had six cases of diphtheria this term, but the disease was brought here by a member of the family who contracted it elsewhere. Before being fully cognizant of the character of the disease, it had communicated itself to another family, but did not get leave to go any further. Dr. Wilson had charge of the cases and easily succeeded in stamping them out.

CARDWELL.

Medical Health Officer's Report.

The village has been in a very healthy condition during the year, epidemic, contagious and malarial diseases having been conspicuous by their absence. There are some unsanitary spots in the shape of pig-styes, etc., which have been tolerated. The surroundings of some of the manufacturing establishments are in an unsanitary condition, but as they are considerably away from the thickly populated part of the village, the Board deemed it wise not to interfere.

CHESLEY.

Sanitary Inspector's Report.

Our village has been kept in a good sanitary condition, and there has been no infectious or contagious diseases present.

CLINTON.

Chairman's Report.

The Board found it only necessary to have two meetings. In inspecting the village, a few unsanitary conditions were discovered, and notices to the number of 100 were

posted, calling on the citizens to "clean up." Dr. Worthington is the Medical Health Officer, but he has not yet sent in his report. We have not had any disease of a contagious or infectious nature, and the village is in a good sanitary condition.

DRESDEN.

Secretary's Report.

Owing to the late fire having extended to the municipal buildings, consuming books and all records, I regret that I cannot give you an extended report of this Board. We have had two or three cases of diphtheria and a few of typhoid—one death. The village is in a very healthy condition at present writing.

EMBRO.

Secretary's Report.

The sanitation of the village is carefully looked after by the Board. There were four cases of scarlet fever, fifty to one hundred whooping cough.

EXETER.

Chairman's Report.

The village was thoroughly inspected, and all unsanitary matters ordered to be put right, which was done in due time. The owner of a cattle stable was ordered to put it in a proper sanitary condition. There have been a few cases of typhoid, whooping cough and one case of scarlatina. In all cases the requirements of the law were observed, and the diseases were all confined to their original places of outbreak.

HASTINGS.

Secretary's Report.

The sanitary inspector reports that he made seventeen official visits during the past year, and that drainage, cellars, privies, etc., are in a good sanitary condition, and the village healthy. The medical health officer has no reports to make, as there were no diseases dangerous to the public health in existence.

HUNTSVILLE.

Medical Health Officer's Report.

A mild type of measles has prevailed without any fatal results. The popular sentiment prevailing here is against isolation, although in every instance this method of precaution is urgently insisted on by me, but not always successful. No other infectious disease has occurred during the year. In view of the fact that a large number of the people require vaccination, I would recommend the Board to put the vaccination law in force. The slaughter house is not in a sanitary condition. The examination and ordering of privies, etc., to be disinfected, had a salutary effect.

KINGSVILLE.

Medical Health Officer's Report.

There were fifteen cases of diphtheria and three deaths during the year. Every possible means were taken for the prevention of its spread. The houses were placarded, disinfected and isolated, all unnecessary intercourse between the inmates being forbidden. The means taken had the effect of confining the disease to the narrowest limits possible. The complaints of unsanitary conditions have been very few. The sanitary needs of the schools have received some attention. Although we have a right to be thankful for the healthy condition of the people, we should not rest contented until the sanitary conditions are such that contagious diseases will have no foothold.

MILVERTON.

Medical Health Officer's Report.

The health of the village is excellent. There have been only three cases of typhoid, one of scarlet fever—one death. I would advise, however, that the law relating to the public health should be far more stringently enforced than it has been.

MORRISBURG.

Secretary's Report.

We have a meeting of the Board when there is any occasion. We have a medical health officer (without salary), and two salaried inspectors. The village has been very free from disease during the year, none contagious occurring.

NEW HAMBURG.

Medical Health Officer's Report.

In accordance with the demands of the Health Act I present my report of sanitary action for the year 1886. In doing so it may be summarised by saying that, what we have done during this year has, in a great extent, been a continuation of the work begun in 1884 and 1885. In so far that the Board has had careful supervision of all nuisances brought to our knowledge, directly and indirectly; outbuildings have been carefully inspected, and when necessary, improved or removed, as well as keeping our water supply for drinking and household purposes properly inspected and tested. The water of many wells was tested, and although an improvement on former years has been found, still much care in future will be needed to control one important factor in the production of disease. Our village has, on the whole, been remarkably free from serious endemic diseases. A few cases of measles, scarlatina, and whooping cough have been reported, but of a mild type. There have been no cases of diphtheria as far as known. A form of "prairie itch" has been reported in our school, but means have been taken to prevent its spread. On the whole, our village has this year been as free from disease as in any former year, and no doubt much of this is due to decided action by the Board on all occasions. The death-rate also has been very low as a natural result. A form of malaria fever has been reported, but no bad results to the community are anticipated.

NIAGARA FALLS SOUTH.

Medical Health Officer's Report.

The only contagious diseases we had for the past year were ten cases of diphtheria, one proving fatal. Otherwise the village was in a healthy condition. The sanitary

inspector reports that pig-pens are giving great annoyance, and says that the law ought to be as stringent in dealing with them as it is with slaughter-houses, none of which we now have.

PORT COLBORNE.

Secretary's Report.

Not a single case of dangerous disease has occurred during the year. Thorough inspection of all premises have been made and found to be in a clean condition. A constant superintendence is exercised over all backyards, etc., etc., the unsanitary condition of which might cause serious disease. Our village is one of the healthiest in the Dominion.

POINT EDWARD.

Secretary's Report.

The health of this village for the past year has been very satisfactory, there being no disease of an infectious nature reported. The Board had nothing to do in consequence.

PRESTON.

Secretary's Report.

Notices to the people to put their respective places in sanitary order were issued in the spring, and subsequently on the inspector's visits it was ascertained that these notices were complied with in almost all cases. The village is now in an excellent sanitary condition. No contagious disease of any kind.

STREETSVILLE.

Secretary's Report.

The village has been well inspected by the sanitary inspector, and on his first round notified all persons to have their premises put in order according to law. It was subsequently ascertained that in nearly all cases the orders were executed. All wells were cleaned out by the 1st of July. The old burying ground in connection with the Presbyterian church is in a bad and overcrowded state. Attempts have been made towards the erection of a new cemetery, but so far the matter remains as it was. Cases of typhoid have occurred periodically in the vicinity of the cemetery, and to its unsanitary condition may be traced the disease. One case of diphtheria, seven of scarlet fever, and five of typhoid, one case proving fatal. Reporting diseases by medical men is very much neglected.

TEESWATER.

Medical Health Officer's Report.

With the exception of a few cases of diphtheria and typhoid of a mild type, there has been no contagious disease in our midst. The Local Board has used its energies in promoting cleanliness and a compliance of the Health Act. To the manner in which this is carried out by the Board and people, may be attributed the excellent sanitary condition of the village.

 THEDFORD.
Secretary's Report.

Twenty-five cases of diphtheria, causes not known. Disinfection, isolation, etc., carried out, otherwise the village has been in a very healthy condition.

WALLACEBURG.

Medical Health Officer's Report.

In the early part of the year scarlet fever made its appearance and continued into the warm weather, notwithstanding that every precaution was taken to prevent its spread. There were thirty-four cases and only one death. In the latter part of February we were visited with a most virulent type of diphtheria. The house was promptly quarantined, but a few days later it was reported in a second house, which was also quarantined. On investigation I discovered that both these cases had their origin in a third case that occurred a week previous, and which came from Dover township. Owing to isolation, fumigation, etc., the disease did not spread beyond these three houses. If proper notice had been given and precautions taken by the physician attending the first case, I am strongly of opinion that it would not have spread any further. As a result of this negligence there were ten cases and six deaths. The schools on the south side of the river was closed. In August an additional case occurred and resulted fatally. I could not trace the cause of this last one. I know that whooping cough occurred numerously and that one death took place from it, but as there were no reports sent in I cannot speak definitely. I examined the water in several wells previously considered good, but I found the water to be bad in all of them. In view of this fact, I think the council should go about having a proper system of water works for the village without delay. The sanitary inspectors distributed circulars containing extracts from the Health Act relating to householders. Pretty general compliance was made by the citizens to the requirements of these circulars.

WATERDOWN.

Medical Health Officer's Report.

In January, February and March, we had a good many cases of whooping cough. A few cases of typhoid came under my notice in the fall, attributed to low and impure water. There have been six cases of diphtheria, but they were all of a mild type. This disease is becoming less prevalent every year; in former years it was very prevalent. I think this gratifying state of things is owing to the ever increasing interest taken in the sanitary affairs of our village. The sanitary conditions of the municipality have undergone a marked change of improvement since the Public Health law came into force. The outbuildings of private houses and of the public schools are now kept in good condition, being frequently and thoroughly disinfected and cleaned out. A sewer has been laid on Main street, which is and will be of great sanitary benefit. There have been very few complaints of nuisances and the health of the people is on the whole excellent.

WATERFORD.

Chairman's Report.

There have been no disease present in our village of a contagious nature, with the exception of whooping cough; but as that disorder was not reported by the doctors in

attendance, I cannot give you particulars of it. Early in the year the sanitary inspector made a general inspection, after which the Board acted on complaints from residents. There were several of these of an unsanitary nature, all of which were satisfactorily attended to. One particular slaughter house was ordered to quit.

WELLESLEY.

Medical Health Officers Report.

We regret that we are not in a position to congratulate ourselves on the general good health of the people as we did last year. Up to the month of September, however, we had reason to believe that everything was sound; but in that month our prospects of a whole year of immunity from disease were rudely shaken by the appearance of diphtheria, which spread so rapidly that in a very short space of time thirty families were involved, infecting a large number of children between four and eight years old, twenty per cent. of them succumbing to the disease. It spread rapidly until the people became able to realize their danger and the importance of isolation and other remedial measures. Some of the people had the misfortune to rely on a worse than worthless *nostrum* advertised and issued by a clergyman of the county, as a "sure cure for diphtheria!" By a diligent enforcement of sanitary laws, the closing of the schools and a solemn warning against "sure cures," we had the satisfaction of curtailing and eventually stopping the onward march of the malady. There were a few cases of typhoid, and a few days ago scarlet fever appeared in a family near Bamberg; it is of a mild type. The health of the people is good with these exceptions.

WELLANDPORT.

Medical Health Officer's Report.

The sanitary condition of the township has been remarkably good, and free from any epidemic of disease during the current year. Recently a few cases of scarlatina have occurred, but by proper precautions they can be confined to their original limit. The disease is of a mild type. No deaths.

WELLINGTON.

Medical Health Officer's Report.

No infectious or contagious diseases reported to me during the past year.

WIARTON.

Medical Health Officer's Report.

In June last a case of smallpox was imported here in the person of a sailor who was on board the *Athabasca*, and came here from Owen Sound sick. Four persons in the family, including first case, had the disease, but owing to the manner in which the cases were watched, isolated, and the house quarantined, the disease was strictly confined to the one house. There were two deaths, which were attributed to the fact that vaccination had not been previously performed. The two that recovered were successfully vaccinated. After this vaccination was generally performed on those in the village requiring it. In May and June we had a severe epidemic of measles, and a few mild cases of scarlet fever. In June a thorough inspection of the village was made, and all unsanitary conditions discovered were removed. We have at present a very clean and healthy village; and as a summer resort it is one of the best in Ontario. The Board of Health has done its duty, and the citizens have done theirs.

TOWNSHIPS.

ADELAIDE.

Secretary's Report.

The inhabitants generally are willing to co-operate with the Board in the carrying out of all regulations regarding the public health, and the result is that our township is free from all diseases of an infectious or contagious nature, and in a good sanitary condition.

ADOLPHUSTOWN.

Medical Health Officer's Report.

The health of the township is, so far as contagious diseases are concerned, and has been for the year, good. I have not been called on to discharge any duty in my official capacity during the year.

ALBEMARLE.

Medical Health Officer's Report.

This township is so gifted by nature in its situation and its good natural drainage and water supply, as to make it almost perfect in its sanitary conditions. During the time that the smallpox was in our neighbouring village of Wiarton, in June last, vaccination in this township became pretty general, and with the view of encouraging it, this Board distributed vaccine points to the different school sections gratis. The Board at present is in a good working condition, and is using its best efforts in the cause of public health.

ALDBOROUGH.

Secretary's Report.

Diphtheria was allowed to prevail in the township owing to the neglect of the physicians attending not reporting cases, and failing to take the necessary precautions measures against its spread. Some members of the Board are anxious to have the law carried into effect, while others are just the opposite. While this unsatisfactory state of affairs last it is impossible for a Board of Health to be effective.

ALICE.

Chairman's Report.

This township enjoyed the best of health until October, when diphtheria broke out, and in a short time nine families were affected. The disease was brought from the town of Pembroke, and was allowed to spread through the neglect of the physicians in charge not reporting the cases until members of the Board happened to find out that the disease was in existence. The Board at once sent Mr. Ryan to placard the houses, and disinfect them, etc. We have the satisfaction to know that by our humble endeavors the disease was crushed out; and the good sense of the people contributed to this satisfactory result. I believe that had we had timely warning the disease would have been prevented

spreading to any serious extent. The council don't think it necessary to appoint a medical health officer, depending on local doctors to report disease. It is now known that this dependence is misplaced, and that physicians do not comply with the law in this respect. The sanitary condition of our township is good, and but for these imported diseases and the neglect specified we would be free from disease of a serious nature.

ANCASTER.

Secretary's Report.

The Board has been engaged actively in prosecuting sanitary measures in the township, cleaning up slaughter-houses, bone-dust factory, etc. There are yet two slaughter-houses that require close watching. There have been seventy-five cases of diphtheria and five of typhoid, and the greatest care was taken to prevent the spread of the former. The water in some cases is bad, and privies are often found to be too close to wells. Disease has occurred through this cause.

ARTHUR.

Secretary's Report.

After the Board was appointed in the early part of the year the following resolution was passed by the council:—"Moved by Mr. Hamilton, seconded by Mr. Feehan: That the reeve be requested *not to call* the members of the Board of Health together unless absolutely necessary.—Carried." This of course quashed the Board, and therefore nothing has been done.

ASSIGINAC.

Inspector's Report.

I have made several inspections of the township and village during the year, and any unsanitary condition met with received prompt attention, with the exception of two or three accumulations of stagnant water, which the Indian Department will have to look after; and I am happy to say that I had the cordial support of the people themselves in remedying any sanitary evil pointed out to them. The village of Manitowaning is in a clean state with the exception of the schools, which are badly in need of improvement both in their interior and surroundings. It is hoped that the trustees will take action in this matter without being compelled to do so, and that the Indian Department will see to the nuisances above hinted at. No epidemic of infections or contagious disease during the year.

ATHOL.

Secretary's Report.

No unsanitary condition of any consequence has come under the notice of this Board. There have been six cases of Diphtheria and three deaths. They were all isolated and prevented spreading any further.

BARTON.

Secretary's Report.

I have carefully examined the fat-rendering and fertilizing works, etc., and although some of them were a little slow in carrying out the orders given them to clean up, yet, in the end, all of them complied. There has been great improvement in sanitary conditions here since the passing of the Public Health Act. We obtained two separate convictions from the magistrate against a party for depositing excreta in the township without exercising the proper precautions to prevent a nuisances, and since that time the law is being better respected. We have taken every means to enforce compliance under the Act with our regulations, and the result is that the people are rapidly becoming co-operative in and appreciative of sanitary reforms. Quite a number of cases of Diphtheria have occurred during the year. I have made careful enquiries from the doctors in attendance as to the cause, but failed to elicit any definite opinion. Every precaution was taken to prevent its spread, and at present I do not know of a single case in the township.

BELMONT.

Secretary's Report.

We have had no infectious or contagious disease here during the year. No report from the Medical Health Officer, as he has left the place, and the Council has not yet appointed another.

BEVERLEY.

Secretary's Report.

The work done by the Board this year was very light. The members met two or three times, but beyond discussing some of the provisions of the Public Health Act, nothing was done. The only epidemic disease was Diphtheria, of which there were a few cases and three deaths; otherwise the general health of the township has been and is very good.

BIG LAKE.

Clerk's Report.

No regularly constituted Board. No Medical Health Officer. No action taken regarding the sanitary condition of the municipality. No infectious or contagious diseases. Members of the council think themselves a local board.

BINBROOK.

Secretary's Report.

As our Medical Health Officer, either through neglect or otherwise, has made no report to this Board for the past year, I cannot say anything further only that the health of the township is good. There was one case of Diphtheria and one of Typhoid, neither of which was reported.

 BLENHEIM.
Chairman's Report.

Early in the year the township was divided into three for the purposes of inspection, a member of the Board taking charge of each. The reports brought in by the members speak highly of the good sanitary condition of their respective districts. Suggestions have been made as to the improvements in the conditions of slaughter-houses, piggeries and the refuse from a cider mill, all of which have been willingly carried out. No contagious or infectious disease for the year in the township. The Board is doing a good work, which meets with the cordial co-operation of the inhabitants.

BOSANQUET.

Secretary's Report.

No epidemic of disease this year. Vaccination has been very generally resorted to, no compulsion being necessary. The only slaughter-house here is kept in good order. Municipality in good sanitary condition.

BROCK.

Medical Health Officer's Report.

During the summer we were threatened with an outbreak of scarlet fever, but owing to the precautions taken it did not spread. There are a few cases of typhoid in the village of Sunderland, but the Board has adopted sanitary precautions which, I believe, will confine the disease to its present limits. There are houses in this village whose cellars and drainage have been bad, but a large sewer was constructed last summer which will to an almost certainty cure this evil. The Board has done a large amount of good in sanitary matters this year. I think that in some cases the wells are too near privies, and that the quality of the water is suspicious. These matters must be remedied, and delinquents given to understand that the instructions of the sanitary inspector must be carried out and the law obeyed. I have much pleasure in bearing testimony to the very efficient services rendered to the cause of sanitary progress in this municipality, both by the sanitary inspector and the secretary of the Board.

BROOK.

Medical Health Officer's Report.

I take pleasure in reporting that the sanitary condition of this township has been better this year than it has been for the past six. No epidemic of any kind has come under my observation.

BRANTFORD.

Medical Health Officer's Report.

I have much pleasure in submitting to you my annual report as Medical Health Officer for the township of Brantford for the year 1886.

There is much difficulty in giving an accurate report of the contagious diseases that have been most prevalent in the township, owing to the inaccuracy of our system of registering deaths and the causes. The township on the whole has been free from any epidemics during the past year.

Diphtheria has shown itself in a few localities in an endemic form. The cases that have come under my observation have been of a very severe type, out of the thirty treated six having proved fatal. This very high mortality was owing to the malignancy of the disease, and the very unsanitary condition of the dwellings in which it occurred. Four or five families west of the village of Newport, living within half-a-mile of each other in houses that were old, small and partially buried in the ground with earth filled up around the foundation, causing the wood to decay and remain in a wet condition. That such a dwelling would cause the disease, I am not prepared to say, but that it rendered the virus much more active and contagious and more difficult to manage in every way, I am sure of. The first case that occurred in this locality was a little boy six years of age who came home from the public school complaining of a sore throat and fever; from this case all the others followed in rapid succession. I have carefully endeavoured to trace the cause of the spread of this disease from this one, and have come to the conclusion that when diphtheria occurs in a locality favorable to the propagation of the virus that produced it, like this locality was, the air is quite sufficient to carry it from house to house. I have upon a former occasion urged the necessity of having the school houses in this township inspected regularly by the health inspector, and that he should be clothed with sufficient power to have at once corrected any unsanitary conditions, even to closing of the schools for a time. The old privy pit is the most common water closet in use in the country school yard, and often within a few yards of it is the well from which the children are allowed to drink. This certainly should not be allowed, when sanitary knowledge can so easily be obtained, and the public so able to carry it into effect. I have endeavored since my appointment as Health Officer of this township to teach the public how best to prevent disease, but it is strange how indifferent they are to those things that pertain so much to the welfare and well-being of themselves and families; indeed, not until the grim monster seizes on some delicate member of a family and leaves it in sorrow to mourn the loss, which by more care and knowledge might have been saved. There is yet much to do in this line. The public must be compelled by legal measures to do their duty. Trustee boards must be instructed to consult the local board of health before they are allowed to select a site for their school house, or make any alteration in the ones they have, that may in any way interfere with the health of the innocent children so cruelly compelled to remain within its walls each schoolday. The laws of health should also be systematically taught in our schools, and legislative power given to trained men to enforce them, and show in every way possible that it is to the close observance of these sanitary measures that a country must look to attain to riches and physical and moral excellence; how to conform to nature's laws relating to man's existence, how to live to a good old age and piss away from natural decay, having suffered only a minimum of pain. Typhoid fever has been much less prevalent in this township than for the last few years. Nearly all the cases that have come under my observation were caused by contagion from patients in the city of Brantford nursing some relative in the city or taking a partially convalescent one to their home in the country, then innocently, perhaps, but from culpable ignorance, nursing the subtle poison in their own homes. This fever with our present knowledge of its cause and prevention can in all country places be reduced to a minimum, whenever the public are willing to be taught and obey the scientific knowledge that is offered to them. Scarlet fever has appeared in a most mild form in the township. About twelve cases were all that came under our notice, and these occurred during the months of July and August. The majority were taken ill while attending school, the families in which they occurred were separated by long distances and could not under the circumstances carry the disease from one to another. With care in isolating cases afflicted with this disease, much may be done to control it on its first appearance. I have been able myself to confine it to a single member of a large family when there was ample room in the house and my instructions faithfully carried out by the nurse. The only other contagious diseases which I will mention are measles and whooping cough. This will cover the list of

diseases which preventative measures employed in time will to a very large extent control. Measles have been prevalent in certain parts of the county, but not in this township. The cases under our observation have been easily controlled and managed. I may say the same of whooping cough. I would here call attention to the fact that during my observation for the last twenty years, these three diseases of childhood I have traced the origin of it to school houses and from these its spread to different families, and sometimes over a whole country side, causing the death of many a promising child. The school room, I consider, above all other places, should be kept in the most sanitary condition, for in it we have every element favorable to the development and spread of disease; delicate children confined in large numbers in insufficiently ventilated rooms for six hours in the day is quite enough in itself to be the primary cause of disease, and will afford rich and well tilled soil for the minute germs that produces these diseases to propagate themselves and be conveyed to the homes of many an unsuspecting family. I might also mention the result of a few visits made by me in company with Mr. Charlton to a starch factory a short distance from the city. This was made in obedience to a complaint made by the Principal of the Indian Institution. We found the creek bed through which the refuse from the factory is washed into the river, was so lined with the albumenoid substance from the washing of the starch; this exposed to the hot summer sun caused a most disagreeable smell, so bad indeed that it was impossible for any one to remain on the banks of the stream without feeling a degree of nausea and sickness. Mr. Charlton ordered the bed of the creek to be scraped, and disinfected with lime and sulphate of iron, etc. I recommended the Inspector to watch the premises and visit them every week till the water was again introduced into the canal which was used to flood the creek every day. In this way we were able to keep down all complaints, and I am not aware that any sickness was produced by it, and if the creek be kept full of water I think no further trouble need be feared; should, however, the break in the dam take place again something different will have to be done by the company to control this nuisance. At the request of the local board of health of this township, I attended the American Public Health Association held this year in Toronto, in October last. At this meeting were present representatives from all the states in the union, California and Great Britain. The meeting lasted four days, during which time some of the ablest papers were read on preventative medicines that I ever had the privilege of listening to. As the annual report of this meeting is to be published and a copy sent to me, which will be the property of this Local Board of Health, I will not attempt to give you even a synopsis of the work done by this able association. While in the city attending the meeting of the American Health Association, the health officers from the Province of Ontario were called together by the Secretary of the Provincial Board of Health, and formed themselves into an Association, called the Association of Executive Health Officers of Ontario. This constitution was framed and adopted by the members present.

Thanking you, gentlemen, for your kind attention in listening to this incomplete report,

I remain, yours,

D. MARQUIS,
Medical Health Officer.

BRUCE.

Medical Health Officer's Report.

I have much pleasure in stating that my attention has not been called to the existence of any case of a zymotic character during the past year. Whooping cough of a very mild type appeared in a few instances. The sanitary condition of the municipality is in a very good condition.

CAMBRIDGE.

Secretary's Report.

With the exception of a few cases of diphtheria and whooping cough among the children, the people have enjoyed excellent health during the past year. The Board has taken effective measures for the sanitary laws of the Province being stringently enforced, and the results are more apparent this year than ever before.

CARADOC.

Secretary's Report.

The sanitary condition of slaughter houses and public and private places have been carefully looked after. There were five cases of scarlet fever, twelve of measles, fifteen of diphtheria, twelve of whooping cough, and five of typhoid. All the places were placarded and the usual precautions taken.

CAVAN.

Chairman's Report.

This Board acts on the good old principle that "an ounce of *prevention* is better than a pound of *cure*;" and, therefore, every means known to us have been adopted for the prevention of the spread of disease, and the abatement or destruction, as the case might require, of every form of unsanitary condition. It is greatly to our efforts in this respect that is due the wonderful immunity from infectious disease we now enjoy; and we have reason to be thankful to the Almighty for crowning our efforts in the public weal with success.

CAYUGA, NORTH.

Secretary's Report.

An epidemic of diphtheria, of not a very malignant type, occurred in the township, and reached its severest stage in September. The school in the locality was closed, and all the standard precautions taken to prevent the disease spreading. There were only two deaths in all. I believe we are now entirely free from diphtheria. The sanitary condition of the municipality, with this exception, has been very good during the year, and is now excellent.

CAYUGA, SOUTH.

Secretary's Report.

The chairman thinks that it is useless for the Board to meet when there is nothing for them to do. It has therefore never met as a Board.

CHAPMAN.

Secretary's Report.

The sanitary condition of this township is very good. Diphtheria was present last March, but owing to the prompt measures adopted for its destruction, it did not spread.

The prompt removal of all refuse, etc., has resulted in good. The former prejudice against the Board is rapidly dying out, and now the people as a whole can see the benefits to be derived from a strict and careful administration of the health laws, and appreciate the efforts of the Board.

CHARLOTTENBURG.

Chairman's Report.

The Board, for the past two years, has been strongly endeavouring to educate the people in sanitary laws, and has devoted its attention to precautionary measures against the spread of contagious disease, and the abatement of all nuisances complained of. Some do and some do not appreciate the Public Health Act, and our endeavours to carry out its provisions. In time, however, education in this important work will have its reward. We have had only one or two instances of refractory parties against the notices of the Board, but this will not be tolerated. We have had only a few cases of whooping cough this year; no diphtheria since last year. The health and sanitary condition of our township is excellent, considering that the experience in the enforcement of laws relating to the public health is comparatively new.

CHARLOTTEVILLE.

Medical Health Officer's Report.

I have the honour of submitting the following report upon the sanitary condition of the township of Charlottetown:—

It is a matter for congratulation that a Local Board of Health has been established in this township to look after its sanitary interests.

The appointment of a sanitary inspector was a move in the right direction, as by his inspection the discovery of many nuisances in the village of Vittoria was accomplished. Although a good deal of illness has prevailed during the last few months, yet in nearly all the most severe cases the origin could be traced to impure water or pernicious water-closet arrangements, and as these are matters directly within the reach of municipal legislation, I would earnestly recommend the Local Board of Health to impress upon the township council the advisability of giving them their mature consideration.

Apart from the climatic condition of the season, which has been one favourable to the development of dysentery, typho-malarial fever and kindred diseases, there have been too many cases of fever to trace them merely to accidental causes, especially in the village of Vittoria. Two well-marked centres have existed for some time, and from these the disease has extended to a considerable distance, and in that direction, *i.e.*, to the leeward of the prevailing winds of this locality, whereas in the opposite direction no cases have appeared, yet the disease has not become at all general. I refer to the piggery and the ravine leading from the piggery, and the slaughter-house attached to one of the butcher-shops. Steps have been taken to check these sources of danger, which, I hope, will prove to be successful. These are the chief apparent causes of the disease alluded to above, yet others exist, which may prove to be the more serious causes of disease, and less easily remedied. I allude to the pernicious water-closet arrangements belonging to nearly all the dwellings in this municipality, and the neglected cleaning out of wells; and another source of disease in our midst is—the foundations of many of the houses are of wood, built close to the ground and banked up with earth during the late fall and winter, retaining dampness, and consequently causing decay of the timbers; as a result the health of the inhabitants suffers.

I would also beg to call your attention to the fact that a very small proportion of the children in this township have proper protection from small-pox—are not vaccinated, and trust the law on this matter will be enforced.

W. J. McINNES, M. D.

CLARKE.*Chairman's Report.*

In March last the Board was duly formed, and the municipality was divided into sanitary districts, each member taking the one assigned him for his supervision. No disease or unsanitary condition arose during the whole year calling for the special efforts of the Board. All the members coincide in reporting the township to be in excellent sanitary condition.

CLINTON.*Secretary's Report.*

Our Board of Health is in existence—not in very active existence. There have not been any contagious diseases for the past year reported. We have no medical health officer.

CROWLAND.*Secretary's Report.*

In consequence of diphtheria, the schools in sections 2 and 3 have been closed. Several children died of the disease. The houses were placarded and isolation and other precautions ordered. The unsanitary condition of the slaughter-house is supposed to be the cause, and notices to the proprietor to have the law complied with received a promise of obedience. Removal to a safe distance was demanded and agreed to by the owner. Otherwise the township is in a good, healthy state.

DALHOUSIE.*Secretary's Report.*

There have been thirty-seven cases of scarlet fever, resulting in the death of three children, and is not yet stamped out. The disease is isolated as soon as discovered. If systematic precautions were taken, however, a large percentage of these cases would not have occurred.

DARLINGTON.*Chairman's Report.*

Nothing has occurred to require the special attention of the Board. No disease of an infectious nature. Township is in a sanitary condition.

DRAPER AND OAKLEY.*Secretary's Report.*

The Board had the Medical Health Officer to vaccinate all the children in the public schools requiring it. The township is in a good sanitary condition. No zymotic diseases of any kind.

DRUMMOND.

Secretary's Report.

No disease of any kind has been reported to the Board, and no precautions taken to keep them out. No nuisances of any kind has been reported. The township is very healthy.

EASTHOPE, SOUTH.

Medical Health Officer's Report.

The township has had a complete immunity from infectious or contagious disease during the year. The health of the people and general sanitary condition of the township are excellent.

EDWARDSBURG.

Secretary's Report.

The Local Board did not take any action regarding the sanitary defects and needs of this township, nor have they complied with the requirements of the Public Health Act. There has been no serious disease, and this may be the reason of its inactivity. [This means that when disease arrives, an effort will be made to prevent its arrival! Ed. Reports.]

EGREMONT.

Secretary's Report.

The Medical Health Officer reports that there were three cases of diphtheria, supposed to be caused by impure water, and one case of typhoid, from same cause; one death from diphtheria. Only one complaint respecting a nuisance was received, and was at once removed. The township is in a good sanitary condition.

ELDERSLIE.

Secretary's Report.

Several cases of typhoid (one family), of which all recovered. Two cases of diphtheria were reported, and each of the houses in which it occurred was isolated, and the usual remedies taken to prevent its spread. No further cases. The scholars have been vaccinated, and the sanitary condition of the schools looked after. Our creamery is in a good condition.

ERAMOSA.

Medical Health Officer's Report.

We had an outbreak of diphtheria in the village of Rockwood of a severe form, in May and June, but by thoroughly isolating the places and the free use of disinfectants before and after convalescence, we had the satisfaction of confining the disease to the three houses in which it broke out. In other places there were also a few isolated cases of the

malady, as well as a few of scarlet fever of a mild type. A larger number than usual of typhoid cases occurred, attributed to the scant water supply. The necessity of getting rid of bad drainage, damp cellars, foul wells and privies, cannot be too strongly enforced on the minds of the people. The general good health of the municipality is satisfactory.

ESQUESING.

Secretary's Report.

The Medical Health Officer reports that no case of contagious disease has been in the municipality during the year, and that the township is in a good sanitary condition.

FLAMBORO', EAST.

Secretary's Report.

The only zymotic diseases that have occurred during the past year were a few cases of diphtheria and typhoid fever. It is gratifying to have to state that families generally are taking a far greater interest in sanitary matters and how to prevent disease than hitherto. The health of the people on the whole, has been very good.

FLAMBORO', WEST.

Chairman's Report.

The sanitary condition of the township, as reported by the inspector, is in a very good state, much better than last year, thanks to the willingness of the people to comply with the law. There are ten slaughter-houses in the municipality and all are kept clean. A large proportion of the children have been vaccinated in compliance with the Act in that behalf. There were three cases of diphtheria and three of typhoid fever. All precautions were taken to prevent spreading—isolation, disinfection, placarding, etc., which were thoroughly successful. These were all that occurred of an epidemic character, and I think we may congratulate ourselves that we escaped so well. Had the sanitary conditions not been so well looked after, it might have been serious.

GARAFRAXA, WEST.

Medical Health Officer's Report.

The general health has been good this year. Diphtheria was slightly epidemic last spring; I had eleven cases, one of which died. No other species of contagious disease. Extracts from the Health Acts have been printed and largely distributed.

GLAMORGAN.

Secretary's Report.

No infectious diseases whatever. The township is laid out into districts and taken charge of by the members of the Board, who carefully look after the sanitary needs of their respective routes, reporting to the Board as a whole, anything that requires attention. The township is, therefore, very well inspected, and the health of its people is very good.

GODERICH.

Chairman's Report.

The slaughter-houses are kept in a clean and proper state. The schools, ten in number, are in a sanitary condition. We are thankful for the entire absence of infectious or contagious disease during the year, and the general health throughout the township is very good. We have had no complaints of unsanitary conditions. On inspections being made it was found that the citizens vie with each other in doing their utmost in keeping their houses and surroundings in a neat and clean state; and they are to be congratulated for entering into the spirit of the sanitary laws disseminated by the Board, and in co-operating cheerfully in their being carried out.

GREENOCK.

Secretary's Report.

The sanitary condition is good. No serious diseases visited us during the year.

GREY.

Secretary's Report.

The Board only met once during the year, there being no work for them to do. The usual notices were sent out to have everything in a sanitary condition before the summer months, and the orders were readily complied with. No contagious disease during the year. We have a Medical Health Officer, so that the Board is now prepared for any emergency.

GRIMSBY, NORTH.

Chairman's Report.

I have great pleasure in stating that the sanitary condition of this township is excellent. There has been only one case of disease of a contagious nature (diphtheria) during the year. The house in which this occurred was immediately placarded and isolated. So prompt were the measures of precaution against its spread taken, that it was strictly confined to its original limit. A nuisance was caused by a mill-pond, and the owner was notified to have it abated, when he cheerfully complied.

GRIMSBY, SOUTH.

Chairman's Report.

There has not been a single case of contagious or infectious disease during the year. We have only one village (Smithville) in the township, and to this may be partly attributed the congratulatory state of affairs. The provisions of the Health Act and of the Vaccination Act, have been carried out.

GUELPH.

Inspector's Report.

The only thing in the shape of nuisances calling for the Board's attention was the smells arising from dead, putrid animals—horses and dogs. These were attended to immediately after being notified of their existence. A few cases of diphtheria of a mild type were reported, which were isolated. Our township is in a good sanitary condition.

 GWILLIMBURY, EAST.
Chairman's Report.

A nuisance was reported to this Board as being in existence in a certain house in the municipality. Typhoid had entered the family, and after one death had resulted, the Board took action and had the nuisance removed, disinfecting the premises, etc. Shortly after this, the premises of another person was reported to be unsafe, and it was ordered to be disinfected, but the agent of the owner thought it was safer than the first mentioned one and burned it! (A thoroughly effective, though expensive, way of getting rid of an unsanitary house). Several other nuisances were remedied. Diphtheria visited one family, several of whom had it, there being one death. The premises were disinfected after the recovery of the remainder of the family. The Board consider the present sanitary condition of the township in a satisfactory state.

HAGARTY.

Secretary's Report.

Diphtheria was brought to an hotel in the township by shantymen, who stopped there on their way north. Three of the children were infected, and two died. It did not spread any farther. The township is in a good sanitary condition.

HAMILTON.

Chairman's Report.

I am happy in being able to state that the health of the township for the year has been very good, there not having been any disease of a serious nature. The sanitary condition of the township is improving year by year. The slaughter-houses and cheese-factories, which were kept in such an unsanitary condition, have this year been kept in conformity with the law. Other unsanitary conditions have received the attention of the Board, and the people now know that the law must be enforced and obeyed.

HAWKESBURY, WEST.

Medical Health Officer's Report.

I have much pleasure in stating that the health of the township has been very good during the past year. There is no contagious disease at present prevalent, although we have had a few mild cases of diphtheria. There was whooping cough and diarrhoea amongst children, but very few deaths.

HIBBERT.

Secretary's Report

There have been a few cases of diphtheria and two of typhoid in the township, but no deaths, nor did they approach an epidemic form. The local committee of the Board visited all places likely to present an unsanitary condition, and while they found some not in a good state, yet on the whole a sanitary condition was found to prevail. Everything possible was done to abate nuisances. The township is now in a very healthy state.

HOUGHTON.*Secretary's Report.*

The Board held only two meetings during the year. Nothing of an unsanitary nature arose in the township calling for the special intervention of the Board. A few nuisances of a minor character were complained of and remedied.

HOWARD.

Medical Health Officer's Report.

No infectious or contagious disease came under my notice during the year, and therefore I can report very favourably as to the general good health of the people. In his report the secretary of the Local Board says there were two cases of diphtheria, which were thoroughly isolated and prevented assuming serious proportions. The houses were well disinfected by fumigation, etc.

HULLETT.

Medical Health Officer's Report.

No serious diseases have prevailed here during the past year, with the exception of diphtheria, which continued in the west end of the township till March. It has been present since January last. A type of malarial fever has been in existence nearly all the year, but at the present time the people generally are in a healthy condition

HUMBERSTONE.

Chairman's Report.

The members of the Board have evinced a fair amount of zeal during the year in the sanitary requirements of the municipality. Our health inspector has made several inspections of dwelling houses and privies, only a few of which required attention. Owing to the absence in our midst of contagious or infectious disease, and of conditions of a grave unsanitary aspect, our medical health officer and members of the Board have had no laborious duties to perform; they are watchful of the health interests of the township, and prepared to meet emergencies should they unfortunately come.

HURON.

Chairmans Report.

The only disease of a serious character we have had in the township this year was two cases of typhoid fever. Two inspections were made of the village of Ripley by the sanitary inspector, and he reports that the instructions given regarding vaults and privies were almost unanimously carried out. However, there were two cases of violation of the law which were brought before the magistrate, and fines were imposed in each case. The township is in a very healthy condition.

KALADAR, ETC.*Secretary's Report.*

It was not necessary for our Board to meet even once. Since the smallpox epidemic there has not been any contagious disease of any account. The place is very healthy, and therefore the officers of the Board have very little to do.

KEPPEL.*Medical Health Officer's Report.*

We had only two cases of diphtheria and one of typhoid. The usual precautions were taken regarding these cases. During the outbreak of smallpox in Wiarton village in the beginning of the year, the Board took the precaution of putting the Vaccination Act into force, and a very large number of the inhabitants were vaccinated. The vaccine used were from the Palmerston, Ontario, farm, and gave entire satisfaction. The duties of the Board, although light during the year, have been performed methodically and with a thorough appreciation of the work devolving on it.

KINCARDINE.*Secretary's Report.*

I am happy to say that our township is in a good sanitary state, and free from disease of an infectious or contagious nature.

KINLOSS.*Secretary's Report.*

No cause to take any precautions against an epidemic or endemic of contagious disease, as there has been none.

LOBO.*Secretary's Report.*

There have not been any contagious diseases in the municipality during the year. The Board attended to any matter that came under its notice. The people are in excellent health, and the township is in a good sanitary condition.

MACAULEY.*Secretary's Report.*

A few cases of scarlet fever occurred during the year, but no precautions were taken by the Board to prevent the spread of the disease, which was therefore allowed to run its course. Children were allowed to attend school without presenting a certificate showing freedom from contagion! No nuisances exist in the municipality.

MAIDSTONE.
Medical Health Officer's Report.

There have been a few cases of diphtheria of a mild type—only four deaths: no other infectious or contagious disease. The small, general death-rate prevailing is due in a large measure to the good sanitary condition in which the township is kept, and the prompt measures adopted for stamping out any contagious disease that has appeared amongst us.

MALDEN.
Secretary's Report.

Diphtheria has prevailed to an alarming extent, especially in September and October. One school was closed (Sec. 2) by order of the medical health officer, Dr. Park. There were some fifty-six cases in all, resulting in ten deaths. Dr. Park put in force every precautionary measure, and the disease is now apparently stamped out. No other contagious disease. The cause of diphtheria here is not known. The Board will take measures to enlighten the people in regard to the duty of the public in relation to this as well as other contagious diseases. I am instructed to get 250 copies of pamphlet No. 15 for distribution.

MANVERS.
Chairman's Report.

Since we got rid of the smallpox epidemic at Pontypool, there have been no cases of serious sickness this year. The only nuisance complained of during the year was that of a piggery situated too near dwelling houses. The Board ordered the owners to have it removed at once.

MARIPOSA.
Medical Health Officer's Report.

There has been no severe epidemic of any kind. There have been a good many cases of whooping cough, and a few cases of diphtheria, both being of a mild type—no deaths. The sanitary inspector made two visits throughout the township, especially the villages thereof, and impressed on the minds of the people the necessity of carrying out the law in relation to sanitary reform. It is gratifying to note that the people are rapidly following into line in this direction; and that they evince a commendable desire of co-operating with the Local Board and its officers in their enforcement of the Public Health Act's provisions. Owing to the deceitful nature of all water supply, so far as appearance, taste and smell are concerned—the bad frequently being as sightly and pleasant to the taste as the good—it cannot be too forcibly impressed on all that it is absolutely necessary to have all wells cleaned out once a year, before the 1st of July. If this is done carefully and well, the chances of many diseases appearing amongst us will be considerably, nay, very materially, lessened.

MARYBORO.
Secretary's Report.

One fatal case of diphtheria this year, the only case coming to my knowledge. There were five cases of typhoid in a family near the flour mill, impure water being the supposed cause. The medical health officer ordered the water to be boiled before using, and there

have not been any further cases there. Recently we have had five cases of typhoid in the village of Moorefield, caused, it is supposed, by the effluvium from a slaughter-house near hand, but not now in use. There is another slaughter-house adjoining the village which, on inspection, was found to be in a filthy condition. The owner was notified to remove the nuisance, which he did forthwith. No further complaint from that quarter. The medical health officer has seen that vaccination has been pretty generally performed. I think I am safe in saying that this township never was in a better sanitary condition than it is at present.

MAYO AND CARLOW.

Secretary's Report.

The Board appointed by the council failed to organize, and of course there was little done. A new Board was appointed on November 8th, which is alive to the sanitary necessities of the municipality. Circulars have been issued by the Board giving directions to the people regarding disinfection, etc., etc., and the school teachers are instructed to carefully examine the children, and if sore throat, itch, or other signs make their appearance, to send them home and give notice to the Board. An epidemic of itch occurred in the municipality and the Board was successful in stamping it out.

MEDONTE.

Chairman's Report.

We have a health officer, but he is not a medical man. There have been only two cases of isolated typhoid in the township during the year—cause unknown. There was one complaint of a nuisance from a James Munro, but on investigation it was proved that there was no cause. Good health prevails among the people, which is a proof of the good sanitary condition of their surroundings.

MEDORA.

Secretary's Report.

No medical health officer. No disease of an infectious or contagious nature. The municipality is in a good condition.

MELANCTHON.

Secretary's Report.

In the beginning of the year several cases of diphtheria and scarlet fever appeared, but owing to the way in which each case was thoroughly isolated they did not spread. The source of the disease cannot well be defined, but it is thought they were imported. The people now understand the danger of such, and when present they keep out of the way. The township is now in a good sanitary condition.

METCALFE.

Medical Health Officer's Report.

There has been an unusual freedom from contagious disease this year. An effort was made to comply with the provisions of the Health Act as far as was possible. The public schools are not in such a sanitary condition as the interests of public health require, but not being instructed to have this remedied I could do nothing.

MONA.

Secretary's Report.

There is a Local Board, but there being no unsanitary conditions dangerous to the public health, a Medical Health Officer or sanitary inspector has not been appointed.

MORNINGTON.

Secretary's Report.

The Board met this day. The doctors do not report infectious or contagious disease, although forms have been supplied them for that purpose. There have been cases, but the Board did not receive any notice, so that they cannot be described.

MORRISON.

Chairman's Report.

A Board has been formed but no Medical Health Officer or sanitary inspector appointed, neither being needed. The several members of the Board individually looked after the sanitary interests of the township, and all agree that it is in a good condition. The people—they are not numerous yet—appreciate the public health law.

McDOUGALL.

Chairman's Report.

Notices were sent out early in the spring to have backyards and privies of dwellings put in order, and to the owners of the four slaughter-houses to put their premises in sanitary condition. The inspector found, on examination, that a good many had not complied, and he notified the delinquents to have the matter attended to at once. Some obeyed, and others did not. With the exception of two cases of diphtheria, we have had no contagious or infectious disease. The township is in a healthy condition.

McNAB.

Secretary's Report.

We had several cases of smallpox in the beginning of the year—two of them proving fatal. Infection came from Horton township. The physicians did not report the cases till they were all over, and the Board, although hearing suspicious rumours, could not act as they did not know whether it was smallpox or not—indeed, one of the doctors said it was not small-pox. Had the Board known early enough, the disease could have been confined to the first case. There were two or three cases of diphtheria in the rear of the township, but the doctors, in this case also, failed to report—none were fatal. No nuisances of any kind were found or complained of during the year.

NICHOL.

Secretary's Report.

No contagious diseases nor unsanitary conditions. Careful inspections have been made, and instructions given the people, which were attended to.

MISSOURI, EAST.

Secretary's Report.

The only matters engaging the attention of the Board for the past year were a couple of nuisance cases which have been disposed of satisfactorily, as no further complaints have been made. The health of the municipality is good—no cases of infectious or contagious disease.

MISSOURI, WEST.

Secretary's Report.

Many nuisances have been abated which, if left alone, might have proved dangerous to the public health. The Board and sanitary inspector have been diligent in having sanitary matters enforced in the township. No serious disease of any kind. The people are rapidly becoming alive to the necessity of Local Boards, and appreciate the action of the authorities in their endeavour to lessen disease by destroying its causes.

NORMANBY.

Secretary's Report.

On the 19th of June the Board met to receive the first report of the sanitary inspector. His reports on this and other occasions throughout the year, state that he met with a generous co-operation on the part of the people in improving the sanitary condition of the township, and says that this condition is excellent. No contagious or infectious disease.

ONEIDA.

Medical Health Officer's Report.

I have met in my practice with a large number of diphtheria and typhoid cases, the causes of which I failed to trace. The village of Hagersville has been free from all epidemic diseases, and a great improvement has taken place in the sanitary surroundings of the inhabitants. A great deal, however, has yet to be done in this direction. I would strongly advocate the introduction of the dry-earth system of the disposal of excreta. The present system of pits is bad, and has most unquestionably resulted in much sickness and death by the sewage from them filtering into the water of the wells convenient to them; and everyone can see that in a large number of cases this proximity of pits and wells in our municipality, is too real to be mistaken even by the most ignorant. I am pleased to state that the public school, during a late visit, showed very agreeable evidences of its good sanitary condition.

ORILLIA, ETC.

Medical Health Officer's Report.

I have pleasure in reporting an almost entire absence of prevalent diseases in the township, there being only a few isolated cases of fever. I would call your attention to the unsanitary condition of Washago village, there being always more sickness in it than

in any other part of the municipality. The drainage is bad, and there is a great want of care and cleanliness on the part of the inhabitants so far as their surroundings are concerned. This matter should be at once looked into, and a careful inspection, under the direction of the Health Officer, made so that your Board may know exactly what is wanted to be done. My opinion is, however, that there must be a material alteration made between the relative position of the municipal council and the Board, before any material progress in sanitary matters can be accomplished.

ORO.

Secretary's Report.

The Board of Health is not very active here. There have been quite a number of cases of diphtheria, caused it is supposed by drinking water polluted by underground soakage from privies—twenty-four cases—and if proper precaution had been taken a large percentage of them at least might have been prevented. The general health with this exception has been good.

OXFORD, NORTH,

Medical Health Officer's Report.

We have suffered from a severe epidemic of diphtheria, which began early in the spring and was very general, not only in this township, but throughout the entire county; seventy-six cases came under my notice. The disease again broke out in October, and is still in existence; twenty-six cases have come under my notice. All the cases were of a mild type and very few deaths resulted. Whooping cough has been epidemic also, a large number of children having been affected. A few cases of typhoid and scarlet fever, mumps and measles have come under my care for the year, but not nearly so many as in former years. Inspections have been made by the sanitary inspector, and where any unsanitary condition was found to exist it was removed. [Nothing is here said as to the causes of the existence of diphtheria and other diseases. We cannot help thinking that if a thorough search had been made, some underlying causation would have been ascertained. What about the water? Has there been a pollution of it by the infiltration of the contents of privy vaults from their dangerous proximity to the wells? etc., etc. Ed. Reports].

PEMBROKE.

Chairman's Report.

The only contagious or infectious disease amongst us this year was diphtheria, of which we had two cases. The action taken by the Board to prevent it spreading was highly successful. Any unsanitary conditions coming under the notice of the Board was attended to.

PITTSBURG.

Chairman's Report.

When nuisances were reported or known of they were attended to. Each member of the Board took a district to himself and carefully inspected it, attending to anything of an unsanitary nature. The township is in a very healthy condition.

PLANTAGENET, NORTH.

Chairman's Report.

We have a medical health officer and sanitary inspector who have recieved instructions to look after the sanitary requirements of the municipality, and it is hoped their action will have the effect of considerably lessening the number of infectious diseases. We had a large number of cases of diphtheria—fifty-two cases and eleven deaths—and eight cases of typhoid and two deaths, while measles was present to a considerable extent, with a large number of itch cases.

PLANTAGENET, SOUTH.

Secretary's Report.

In March last a case of smallpox occurred, and the Board took immediate action to confine the disease to the house in which it was, which was successful. There have been cases of diphtheria throughout the township, but as they were not reported by the physicians in attendance the Board took no action! The sanitary condition of the township is fair and the health of the people good. [So that the Board was cognisant of the presence of diphtheria or any other epidemic disease in its district, it was its bounden duty to investigate and take steps for the destruction of the disease and the prevention of its spread. Local Boards should do their duty without being solicited to do so, the Public Health Acts have already done the "soliciting" and they, and they only, should be obeyed. Ed. Reports.]

PLYMPTON.

Secretary's Report.

No epidemic of any kind of disease. The township is in a very healthy condition.

PROTON.

Chairman's Report.

A few cases of scarlet fever broke out amongst the children in the village of Dundalk—three deaths. The schools were closed for two weeks and the usual precautionary remedies taken to keep the disease from spreading. The citizens generally were personally notified by members of the Board on their rounds of inspection to have their premises put and kept in a sanitary condition. This was attended to. I am happy to say that the township is in a good healthy state.

PUSLINCH.

Inspector's Report.

We have had six cases of diphtheria and one or two each of scarlet fever and typhoid; one died from diphtheria, the other five being reported by the physican out of danger. Isolation, placarding and disinfection confined the disease to the one house. The school

was also closed as a precautionary measure. All complaints, and they were many, real and imaginary, of any unsanitary nature were promptly attended to and satisfactorily disposed of. Some of the slaughter-houses are in an unsanitary estate; indeed some are so old and saturated so badly with deleterious matter that it would be hard to keep them clean. There should be no such industries in villages, they should be removed to safe distances, and piggeries also. I found the sanitary surroundings of schools in a very good condition, all but one well which wanted cleaning badly, and this was attended to by the trustees. I have pleasure in stating that at the present time the township is in a good sanitary condition.

RAINHAM.

Secretary's Report.

Six cases of diphtheria occurred all in one family. Isolation, disinfection, etc., were adopted and the disease did not spread. Sanitary condition excellent.

RALEIGH.

Chairman's Report.

The Board has directed its attention principally to the removal of nuisances and the enforcement of laws respecting vaccination. The stagnant water nuisance in the village of Fletcher has been removed, and as a consequence there is a marked falling off in malarial cases of disease. Active measures have been taken in the matter of vaccination, 500 vaccine points having been purchased from the Provincial Board, and all the school children requiring to have the operation performed were vaccinated. As remarked in a former report, our water supply is entirely surface water, and is liable to pollution from various causes. The Medical Health Officer has had his attention drawn to this matter, and the Board has no doubt but that a large proportion of the endemic disease of the township is due to this cause. The secretary sent circulars to every medical practitioner in the municipality, asking them to send their reports of infectious or contagious disease to the Board, but with the exception of the Medical Health Officer not a single report has been received. When gentlemen fully cognisant of the evil consequences of disobedience to the law calling upon them to perform this duty in behalf of sanitation, how can they or any one expect that pupils in sanitary science, represented by the majority of the people of this township, will obey laws ignored by those who should be, but are not, their teachers? In consequence of the extensive drainage which has been in operation for several years past, the township is now free from swamps or wet land.

RICHMOND.

Secretary's Report.

In February last, the sanitary inspector was instructed to notify the owners of all premises, to have them cleaned up and disinfected, which was duly observed. In November diphtheria broke out in a house and six of its members were stricken with the disease, resulting in three deaths. The Board took active and successful measures to prevent the disease spreading from the one house.

ROCHESTER.

Medical Health Officer's Report.

During the year we have had two slight outbreaks of diphtheria, producing a very small mortality, there being forty-three cases and only four deaths. There is great room for improvement in our water supply. The wells should be carefully guarded against the possibility of any sewage whatever entering them. The extensive drainage carried on latterly has been of great benefit to the public health. The water of the public schools wants looking after. On the whole people are healthy and the township in a clean condition.

ROSS.

Secretary's Report.

The Board gave notice to the school trustees to have the children of the schools regularly inspected, so that the first symptom of infectious disease could at once be discovered and remedies adopted to prevent its spread. Several cases of diphtheria and scarlet fever occurred and precautions taken regarding isolation, etc. Several complaints *re* unsanitary conditions received the attention of the Board and were remedied. The Medical Health Officer now reports the township in a good sanitary condition.

RYDE.

Secretary's Report.

Although the members of the Board have been constantly on the alert, they have not found anything of an unsanitary character in the township calling for their interference.

RYERSON.

Secretary's Report.

Nothing of importance to report. No disease whatever during the year. The Board is ready when occasion demands it to comply with the Public Health Act.

SARAWAK.

Chairman's Report.

The owner of a slaughter house was convicted twice for keeping his premises in an unsanitary condition. After the second conviction he thought it better to obey the law and did so. The Board recommend the general vaccination of the people requiring the operation performed next year. The trustees will be requested to admit no child recovering from an infectious disease without a medical certificate. The schools have been inspected and are in a fairly good sanitary condition. The outbuildings might be improved however. Instructions were given to this effect, and it is expected the trustees will have matters put right.

SAUGEEN.

Medical Health Officer's Report.

There has not been any contagious or infectious disease in the township for the past year, and a remarkable absence even of endemic disorders; so much so that I am happy in being able to pronounce the health of the township excellent. The people are to be congratulated for the manner in which they have obeyed the sanitary regulations of the Board in keeping their premises in a clean and healthy state.

SAULT STE. MARIE.

Secretary's Report.

In the latter end of last year and the early months of this we had a severe epidemic of diphtheria in the township convenient to the town, in which fortunately there was not a single case. Two families living in separate townships lost four children respectively. The remarkable freedom from disease of infectious or contagious nature which our town has enjoyed, is in a great measure owing to the great vigilance of our sanitary inspector, who insists that the law be obeyed in dealing with all matters requiring its enforcement.

SOOTT.

Medical Health Officer's Report.

It is a matter for congratulation that the sanitary condition of this township has been during the year in such excellent shape as to render a lengthy report from me unnecessary. In diseases of an infectious nature we have had only a few cases of whooping cough, no diphtheria, scarlet fever or typhoid. It is known that children have attended school before they were entirely free from whooping cough. This is a pernicious habit and one that is fraught with much danger. A certificate of a medical man should be demanded by the teacher from all children who have had any species of infectious ailment before granting them re-admission, and children of the same family as those infected should not be admitted to school unless they present a certificate showing that the incubatory stage of the disease has been passed.

SENECA.

Medical Health Officer's Report.

In my various tours through the township I have found that the most of the instructions of the Local Board have been carried out, and the greater part of the township is fairly healthy and in a clean condition. On the part of some, however, there is a want of appreciation of the benefits to be derived from cleanliness, but each year's experience shows a decided advancement in sanitary affairs, and the people are rapidly becoming in accord with the law. The general health has been very good; no epidemic has been noticed, and there have only been a few cases of diphtheria.

SHERBROOKE.

Secretary's Report.

The sanitary condition during the year has been good; no contagious diseases; general good health prevails.

SOUTHWOLD.

Secretary's Report.

The cheese factories and dairies have been kept in a first-class condition, and the slaughter-houses have been greatly improved and are now in good sanitary order. No contagious disease, showing conclusively that sanitary laws are receiving attention.

STAMFORD.

Secretary's Report.

There have been six cases of scarlet fever of a mild type—all recovered. Although improvements in our sanitary condition can be made, and such will be made as the knowledge of sanitary matters advances, yet our township will compare very favourably with any other in the county in that respect. Physicians have been notified that they must report all disease of an infectious or contagious nature under their care to this Board. The Board is doing its best to have the Health Act enforced.

STANHOPE, ETC.

Secretary's Report.

The Board has no report to make, as our division is very healthy. There were two cases of Diphtheria and every precaution taken, such as isolation, etc., to prevent its spreading. There were no deaths.

STISTED.

Secretary's Report.

The Board met and reported that the township is quite free from contagious or infectious disease and in a very good sanitary condition.

SYDENHAM.

Medical Health Officer's Report.

For any other part of the township only my own can I say anything relating to infectious or contagious disease, as I had none reported to me by the resident physicians. There have been several cases of diphtheria in my district, which can easily be traced to an epidemic of that disease in the southern part of the township. Some of these cases were very severe, but under proper treatment they all recovered. After this we had a case of smallpox in the person of a young man who was on board the S.S. *Athabasca* and who came to Leith. The house was isolated and all precautions taken against the disease spreading; they were successful. An hospital was erected and in the event of the disease coming back again we will be in a better position for the isolation of it. Then scarlet fever made its appearance six miles from Annan; the house was immediately isolated, but the child died; another took it and recovered, and the disease spread no further. It came from outside the township. Measles appeared in a family, but did not spread beyond it. At the present time I know of no infectious disease in the township. Vaccination to a large extent has been carried on, especially among the school children, and on the whole the township is in a good sanitary condition.

ST. VINCENT.

Secretary's Report.

The only case to which the attention of the Board was called during the year was a nuisance arising from the bad condition of the privies on the school grounds of S. S. 14. The attention of the trustees was called to the matter and they had the nuisance removed. The sanitary condition of the township and the health of the people is good.

THOROLD.

Inspector's Report.

The four slaughter houses in the township are in a good sanitary condition. The only nuisance complained of is a pool of stagnant water in the village of Allanburg, belonging to James Upper. This pool is of considerable area and dries up in the summer, but in the spring becomes again filled and stinking. The Board will have to take the necessary steps to have this unsightly nuisance removed.

THURLOW.

Medical Health Officer's Report.

A few cases of scarlet fever, diphtheria and whooping cough occurred during the year four deaths being reported. A cheese factory complained of was visited and found to be in an unsanitary condition, and the owners notified to put matters right, which have been done.

TILBURY, EAST.

Secretary's Report.

Owing to the fear of smallpox coming from Detroit, where it was early in the year, our Board took advantage of the scare and had a large number of the inhabitants vaccinated. Early in the summer an outbreak of diphtheria occurred and gradually increased in virulence till November and then suddenly almost disappeared. Every precaution was taken to arrest its spread, and to these precautions may be attributed its sudden flight from our midst. The outbreak is alleged to have had its origin in the wells becoming tainted, owing to the extreme dryness of the summer lowering the water in the wells, in some cases almost to complete dryness. There were a few cases of typhoid and scarlet fever, but they did not spread to any great extent. Otherwise the health of the people has been good. Great improvement has been made in the sanitary condition within the past few years.

TILBURY, WEST.

Secretary's Report.

Diphtheria has been the most prevalent contagious disease we have had during the year. There were also a few cases of typhoid. The cause of these diseases is attributed to privies in many instances being too close to wells.

TORONTO.

Secretary's Report.

We have had a few cases of diphtheria in families who were cognizant of the precautions necessary to be taken under such circumstances, and they adopted isolation and the usual disinfectant and fumigation process. Fortunately they were able to defray all expenses themselves. This was all the kind of contagious disease we have had in our midst this year. The Board caused the school trustees to change the site of the proposed new school house, from a marsh to a more healthy locality.

TUCKERSMITH.

Secretary's Report.

No contagious diseases have made their appearance, and the municipality is in a good sanitary condition.

TURNBURY.

Chairman's Report.

I am happy in being able to report that our township is in a first-rate sanitary condition. The Board appointed Dr. Bethune Medical Health Officer, in August last, and gave him instructions to have the laws relating to compulsory vaccination enforced. He promised to visit the schools and other places for that purpose, but up to the present I am sorry to say that he has not made these promised visits; and vaccination and the laws in relation thereto remain *in statu quo*.

USBORNE.

Medical Health Officer's Report.

Diphtheria which has been so prevalent in years past in our township, entered only into two families—two cases—this year. First case was in February, and recovered; the last case was in October, and proved fatal, the patient succumbing to paralysis of the heart. In each case isolation and thorough disinfection resulted in a complete mastery of the disease, destroying the chance of its spread. We had only three cases of typhoid this year, the first being imported from vicinity of Owen Sound, from where he removed to Usborne, where he died. The physician attending informed me of the particulars. The widow of the first patient was ill with the disease in a mild form, which she communicated to the child of the people she was stopping with. The precautions taken were similar to those adopted in the diphtheria cases and resulted in confining typhoid to the one house. We had a few cases of dysentery, some being very severe. While I have great satisfaction in calling attention to the comparatively small amount of disease of an infectious or contagious nature with which we have been visited, and to the general excellent health of the community, I must tell you that a great deal has yet to be done by the Board in the direction of unsanitary conditions throughout the township. The schools, for instance, want looking after, the privies attached to them, the drainage of their grounds, and the hygienic properties of their internal construction. The health of the children depends on these matters being thoroughly attended to from year to year. The wells, drainage and privies of many private dwellings are not in a sanitary condition, and it is a wonder the general health is so good. In order to comply with the law the Board must act—its power is undoubted—and have every unsanitary condition in the township destroyed. Thorough, judicious inspection will show what is required, and that much remains to be done ere we approach a state of anything like sanitary perfection.

 VESPRA.
Secretary's Report.

No contagious or infectious disease of any kind in the township for the past year. The sanitary inspector has had all unsanitary conditions remedied, so that the municipality is in a good healthy state.

WAINFLEET.

Medical Health Officer's Report.

The Board has had very little to do in remedying unsanitary conditions, for the reason that our township during the year has been almost free from such. I would advise, however, that a sanitary inspector be appointed and a special inspection made of the privies in connection with schools and dwelling houses, and their comparative distances from drinking water. I think good would result from this course.

WATERLOO.

Secretary's Report.

The Board had a large number of bills containing important provisions of The Health Act distributed amongst the people, and the instructions were invariably carried out by them; they are becoming rapidly educated and interested in sanitary matters. No malignant type of disease has visited us during the year, with the exception of two cases of diphtheritic croup, one of which proved fatal. I am very happy in being able to state that the general health and sanitary conditions are good, and this may, in a great measure, be attributed to the people themselves, who, on all occasions, evince a desire to second the Board in its duties to the public.

WATT.

Secretary's Report.

The sanitary condition of the township is in a very good condition, and the general health of the people excellent. No contagious or infectious disease has occurred during the year.

WAWANOSH.

Medical Health Officer's Report.

We had a mild epidemic of diphtheria—twenty cases, two deaths. With the exception of this and about twenty-seven cases of dysentery, the township has been in an excellent healthy condition during the year. No nuisances have been seen or reported, and there are no sources of malaria in our midst.

WELLESLEY.

Medical Health Officer's Report.

With the exception of a few cases of typhoid fever, which terminated favorably, there has been no disease present calling for any special action. The Board would recommend that in view of the fact that so many villages exist in this township, a lax administration of the Health Act and other unfavorable circumstances, said villages might become the breeding grounds for contagious and infectious diseases. The law bearing on the disposal of refuse, offal and excrementitious matter should be enforced in the villages of Bamburg, Crosshill, Hawksville, Heidelberg, Linwood, St. Clements and Wellesley.

WESTMINSTER.

Chairman's Report.

Our township has been very healthy during the past year, there having been no infectious or contagious disease present, except a few cases of typhoid fever, which were isolated and prevented from spreading. Only a few complaints of nuisances of a mild kind have been made, and these received proper attention from the Board.

WHITBY EAST.

Secretary's Report.

There have been a few cases of diphtheria and typhoid, but they did not spread to any serious extent. Complaints have been made of the unsanitary condition of places where pigs and cattle were kept as being nuisances. The board dealt with these in a satisfactory manner; and for the people it must be said that they, in every case where the Board is called upon to act, evince a thorough appreciation of its interference in the prevention of unsanitary abuses. So far as is known, the township is free from contagious or infectious diseases at the present time.

WHITECHURCH.

Secretary's Report.

There has not been a case of contagious disease reported during the year, although I have reason to believe that there have been isolated cases of diphtheria and measles in the township. One case was investigated by the medical health officer and two other doctors, and they arrived at the conclusion that the disease was caused by the general unsanitary condition of the premises in which the disease was. The Board remedied this at considerable expense.

WILLIAMSBURG.

Secretary's Report.

The Board investigated complaints against two slaughter-houses in different parts of the township. Both were found to be nuisances under the law, and the proprietors were ordered to put them in a sanitary condition; no complaints since. Cheese factories are in a fair sanitary condition; no hog-pens are allowed to be in connection with them, the whey being returned to the patrons. Diphtheria is said to prevail in one section of the township, but the rumour has not been authenticated by any report from a medical man.

WILLOUGHBY.

Secretary's Report.

The board exercises a general supervision over sanitary matters in the township, but in the absence of any infectious disease the duties of its members have been very light

WOOLWICH.

Medical Health Officer's Report.

Early in the spring a general inspection was ordered, and public notices posted in all public places. I personally made almost a house to house inspection of seven villages. Their sanitary condition, although not perfect, was found to be greatly improved since last year, all the surroundings, piggeries, etc., etc., being in far better shape, the styes being removed to the required distance from dwellings. The water is good, and although the

wells are not often cleaned, still the absence of typhoid and diphtheria seems to prove the good quality of the water. There have been a few cases of diphtheria, but none fatal; and the same way with typhoid and scarlet fever—all were mild. The township is in a good sanitary condition.

YONGE, FRONT OF.

Secretary's Report.

There has not been any epidemic disease in the township during the past year. The sanitary condition of the township is very good. The cheese factories have been inspected and suggestions of improvement made to their owners. Owing to the smallness of the township and its immunity from serious disease, there was not a medical health officer appointed.

ZONE.

Secretary's Report.

I have great pleasure in stating that, with the exception of three serious cases of typhoid, we have been blessed with an entire freedom from infectious or contagious disease. Owing to the prompt execution of precautionary measures for isolation, disinfection, etc., etc., in these typhoid cases, we had the satisfaction of soon stamping them out. No deaths. The schools in the various sections were inspected, and where it was found that unsanitary conditions existed, the trustees were notified to have them remedied without delay. Sanitary matters are progressing satisfactorily in our township.

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SIXTH ANNUAL REPORT

OF THE

PROVINCIAL BOARD OF HEALTH

OF ONTARIO,

BEING FOR THE YEAR 1887.

Printed by Order of the Legislative Assembly.



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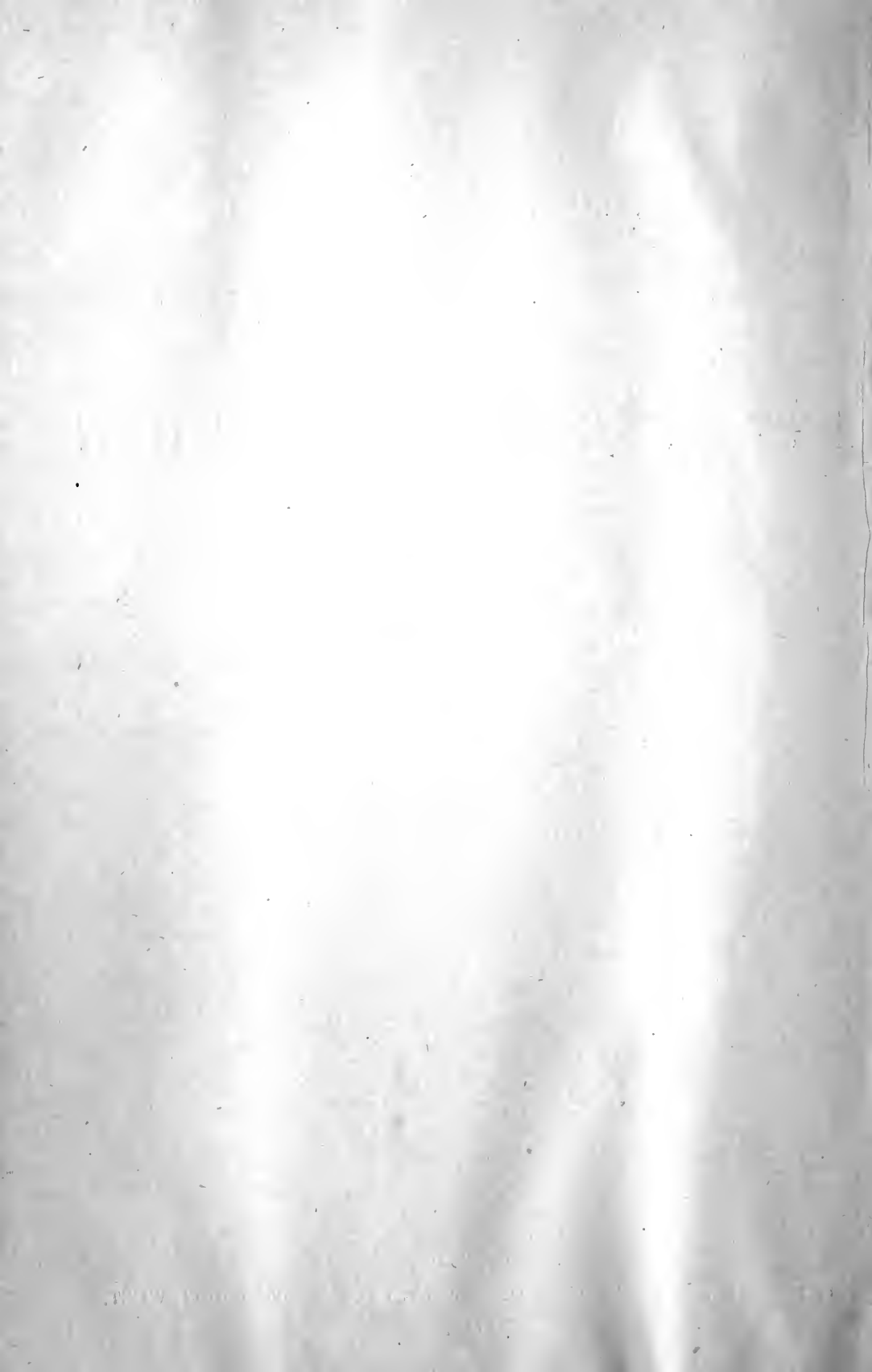


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SIXTH ANNUAL REPORT

OF THE

PROVINCIAL BOARD OF HEALTH.

TO HIS HONOUR SIR ALEXANDER CAMPBELL, K.C.M.G.,

Lieutenant-Governor of the Province of Ontario.

May it Please Your Honour :

The Provincial Board of Health begs leave to present this its Sixth Annual Report. In doing so the Board takes pleasure in informing your Honour that during the year the Province has been free from Smallpox and Cholera, the two diseases which invariably cause widespread alarm whenever their presence is known or their approach with reason expected. While realizing, however, with thankfulness this immunity in the past year, your Board does not fail to remember that so long as this continent holds commercial relations with the crowded centres of population in Europe, Asia and South America, where these diseases may be said to have become endemic, there must continue to exist the danger that from time to time cases of both diseases will reach United States and Canadian ports, and that the safety of these two countries will depend wholly upon the vigilance with which the gates of entry thereto are guarded. As regards the work of the Board in this direction it is satisfactory to be able to inform your Honour, that the Board's efforts to bring before the proper authorities the importance to the Province of having our Dominion Quarantine System as completely equipped as is possible with the present state of scientific knowledge on the subject have not been wanting in results. To-day we have the pleasure of knowing that at the chief ports of entry for immigrants to the Dominion, along the St. Lawrence, there is in operation under the quarantine regulations of 1887 a system of inspection as complete in most respects as at the famous station of the Mississippi below New Orleans. The improvements contemplated for 1888 will make this high state of efficiency still greater. The Board begs further to say that in consequence of the importation of Asiatic cholera to New York in September and of the revelations regarding the crude and imperfect state of the quarantine system there, which made it possible for the disease to exist for a period of two months in that port, your Board through its representative brought these matters before the American Public Health Association, at its last meeting in Memphis in November, and made enquiries as to what protection Canada was to expect through the American quarantine.

The absence of any unified system of quarantine for the United States, makes this question a grave one for Canada as also for internal American States; and the representatives of internal States have publicly warned the Atlantic States authorities that internal or land quarantine will be rigidly enforced against any such ports, which through neglect allow these diseases to find serious foothold within them. That the entry of such

diseases to Canada becomes possible through such sources we have abundant evidence, inasmuch as the Montreal smallpox outbreak of 1885 was occasioned through the importation of the disease primarily from New York.

We regret to have to state that Diphtheria to which very extended reference was made in the Report for 1886, has continued in many municipalities during the past year, in some localities assuming the appearance of a localized epidemic. The various facts regarding it have been fully set forth in the Report of the Secretary which follows this introduction. The intimate relations which this and other diseases have been found to have with public milk supplies have caused the Board to bring from time to time the attention of milk inspection both before your Government and those of our municipalities. It is with much pleasure we draw your attention to the series of reports on the subject found in the Report of this year as also of 1886, and inform you that everywhere throughout the Province Local Boards are realizing the immense importance of the question, and many are instituting rigid systems of registration and inspection, as also of milk standards and milk analysis. The dangers which arise from either none or defective systems of sewerage are from year to year more largely impressing themselves upon our Local Boards and, as will be learned from the reports which follow, various cities and towns have been moving to secure public systems of sewerage. Similarly their counterpart public water supplies are being enquired into; and on all sides, as will be gathered from the special reports and annual reports of Local Boards, the search after sufficient and pure local supplies is proceeding rapidly.

The reference made to this Board by the Local Board of Guelph Township, regarding the existence of a mysterious disease which had been destroying cattle pasturing on certain flats along the river Speed below Guelph city, caused enquiries to be instituted, resulting, as will be seen in the detailed report on the subject printed herewith, in the conclusion that the disease was none other than "Charbon," "Splenic Disease" or Anthrax, which for many years has proved a source of enormous loss to France, Germany and other European, as also Syrian countries. That the disease tends to spread can be gathered from the report on this subject for 1887 of the Agricultural Department of the Privy Council, Great Britain.

No herbivorous animals are immune from its attacks, while man, when exposed suffers seriously.

The importance of eradicating the disease before it obtains a foothold in this Province is paramount; and your Government have had brought before it such measures as the Board deems practicable toward the desired end. The intimate relations which the work of this Board holds toward that of the agricultural interests of the Province, as seen in these last paragraphs, make it most desirable that facilities for conjoint action, whenever necessary, be supplied. The work of enquiry in these directions has its necessary sequence in action; but in both these your Board finds the facilities at its command greatly limited. Every Department of Health to-day in order to do effective work must have means for investigating outbreaks and causes of disease; and it is to be hoped that your Government will find it possible to place such, at no distant date, at the command of the Board.

FRANCIS RAE,
Chairman Provincial Board of Health.

REPORT OF THE SECRETARY.

To the Chairman and Members of the Provincial Board of Health :

GENTLEMEN,—In bringing to your notice the work of the year, it is with special pleasure that I recall to your attention the fact that the Province has, during another year, been free from epidemic outbreaks of any disease which, like cholera and smallpox, cause widespread alarm, thereby affecting the steady and daily operations of commerce and the safety of the lives of the people at large. It will not, however, be absent from your recollection that other diseases of a zymotic character have been present in an endemic form, and in some cases even as local epidemics ; and were it not that some of those have become almost endemic, we doubt not they would have been dreaded as much as either of those mentioned.

I.—OUTBREAKS OF DISEASE AND ISOLATION HOSPITALS.

We have to refer especially to diphtheria, which has been present in many populous centres and which, as referred to in the last Annual Report, had in the last quarter of 1886 attacked the inmates of one of our public institutions, to the extent of creating general alarm and directing the attention of the Board to the discussion of what measures ought to be taken for dealing with a disease so fatal in its consequences, while so insidious in its onset and appearance. The recommendations then adopted by the Board were not sanctioned by an Order in Council, but the statutory enactments of the Legislature of 1887 placed the Board in the position of having to enquire into the measures which Local Boards were adopting for stamping out this and other scheduled diseases, appearing amongst them. The powers contained in section 6 of said Act are of a character so important, that your Board discussed the question of how far the clause demanded enquiry into those facilities which are now deemed necessary to be constantly at hand for isolating first cases of zymotic diseases when they do appear. The following remarks by the efficient Medical Health Officer for Chelsea, London, England, puts the case as it appears everywhere most concisely regarding notification and isolation. Speaking about scarlet fever, which has recently prevailed in parts of London, he says, “ In the case of scarlet fever the complete separation of the sick from the healthy is the most important precautionary measure. We have had an illustration of the advantages of isolation in this parish during the present epidemic. In the poorest parts the parents have almost all been willing to let their children be removed to the hospitals, which are maintained for the purpose of isolating cases of scarlet fever which cannot be isolated at home ; the result has been that we have been comparatively free from the disease. But, on the other hand, in the outlying part of the parish, which comprises the Queen’s Park estate, where the houses are of a superior class to those I have referred to, a large proportion of the cases have been treated at home. The circumstances of the family have been such as to preclude the possibility of anything like complete isolation, and as a natural consequence the disease has prevailed far more extensively in that district. The isolation of a person may be carried out in three ways. In a large house a separate floor at the top may be devoted to the sick and the nurse, all communication practically being cut off. In a smaller house, where such is impossible, the patient can be kept at home if the others who are not infected be provided for elsewhere. This plan is, however, imperfect and seldom practicable. The third alternative is to send the case to a hospital, where in the vast majority of cases isolation can be far better carried out than at home.”

Acting upon the supposition that from the practical standpoint, the Board ought to endeavour to prevent outbreaks of such diseases, the Board had drawn up by its Com-

mittee on School Hygiene, a memorandum* setting forth the clauses of the Act bearing upon the duty of teachers and trustees with regard to cases of contagious disease appearing amongst school children or in the families whence they come, and transmitted them to the Department of Education, recommending that the Department issue model forms for the use of the School Boards, and that it urge their adoption upon these latter.

The Department acknowledged the reception of them with thanks, and it was stated by the Minister of Education to be his purpose to utilize the recommendations in such manner as to him might be deemed most convenient and effective. The sections of the Public Health Act, 1887, bearing upon the subject have been printed in the last edition of the School Regulations, but we do not understand that any blank forms as models have been issued by the Department to the School Boards. We trust that so important a matter will not be omitted during the coming year, as our personal experience as

*TORONTO, July 25th, 1887.

To.....Teacher of.....
School, Municipality of.....

SIR,—According to a resolution adopting the report of the committee on school hygiene of the Provincial Board of Health, dated March 18th, 1887, the Secretary of said Board was instructed to communicate with the Department of Education urging publication and transmission to all public and high school authorities of the provisions of the Health Acts for controlling contagious diseases amongst school children.

To this end the various clauses of the Acts and regulations have been arranged in the following order; and in addition thereto there have been appended the points which, in the report of the committee on school hygiene, were recommended to be contained in blanks to be supplied to the teacher by the school authorities as provided by the Act.

STATUTORY PROVISIONS

Re school protection against infectious diseases.

1. Whenever a case of smallpox, cholera, scarlatina, diphtheria, whooping cough, measles, mumps, glanders, or other contagious disease exists in any house or household belonging to which are persons attending school, the householder shall, within eighteen hours of the time such disease is known to exist, notify the head teacher of such school or schools and also the Secretary of the Local Board of Health of the existence of such disease, and no member of such household shall attend school until a certificate has been obtained from the Medical Health Officer or legally qualified medical practitioner that infection no longer exists in the house, and that the sick person, house, clothing and other effects have been disinfected to his satisfaction; and until such certificate shall have been obtained, it shall be the duty of every member of the household, and of the teacher, to use all reasonable efforts to prevent the association of members of the said household with other children. (Section 1, Cap. 34, Stat. 1887.)

2. Whenever the Local Board of Health or any of its officers or members knows of the existence in any house of smallpox, cholera, scarlatina, diphtheria, whooping cough, measles, mumps, glanders or other contagious disease, they shall at once notify the head or other master of the school or schools at which any member of the household is in attendance; and should it not be evident that said member has not been exposed to said diseases, or any of them, the teacher must forthwith prevent such further attendance until the several members present a certificate stating that infection no longer exists, as provided in the preceding sub-section.

3. Whenever a teacher in any school has reason to suspect that any pupil has, or that there exists in the home of any pupil any of the above mentioned diseases, he shall be required to notify the Medical Health Officer, or, where none such exists, the Local Board of Health, on forms supplied by the school authorities, in order that evidence may be had of the truthfulness of the report; and he shall further be required to prevent the

In connection with this same point your Board discussed very fully in a report introduced by the Committee on Foods, Drinks and Adulterations, the bearing of the same clause on the control which Local Boards should exercise over that source of food of first importance to health, viz: our public milk supplies. Realizing from recent evidence collected on every hand how liable this food is to carry germs of disease, through its being a good culture medium, and how in a triple sense the dangers of its direct contamination exist, either (*a*) through diseased cows; (*b*) through the persons handling the milk and milking the cows; (*c*) through its standing in impure cellars, shops, or receiving polluted

School trustees may require certificates of vaccination.

Students of High Schools, etc., may be required to produce certificates of vaccination.

REGULATIONS.

PROPOSED BLANK FORM FOR TEACHER'S REGISTER.

1.	2.	3.	4.	5.	6.	
Name of pupil absent sick.	Names of pupils absent through illness of others.	Date of notification received from. From School Board. From Local Board. From Medical Health Officer.	Name of disease.	Date of certificate of recovery with name of physician.	Date of re-admission.	Enquiries by teachers and remarks regarding the suspected cases.

waters, the Board deemed the time most opportune when the danger was pressing, of obtaining an official expression of opinion from the head of the Department as to the scope of clause 6. The report of the Committee, the memorandum and the reply of the Minister thereto are found printed in a report found in a later part of this report. The opinion subsequently expressed by the Minister in an interview was to the effect that undoubtedly the clause enabled the Board to insist upon the periodical inspection of milk in those municipalities where outbreaks of such diseases existed, as are commonly considered and known to be communicated through milk.

Through the various stages of this interesting and important matter, observation was not wanting of how those engaged in the businesses of practical cheese-making and butter-making were similarly discussing measures by which they would be more likely to receive for these purposes milk, rich, wholesome and unadulterated either by disease in man or animals or by polluted water. †

BLANK FORM SENT BY TEACHER TO MEDICAL HEALTH OFFICER OR LOCAL BOARD.

Christian name and surname of patient.....
 Age of patient.....
 Locality (giving street, number of house or lot) where patient is.....
 Name of suspected disease.....
 Number of children from that house attending school.....
 Signature of Teacher.....
 Teacher in.....School.

† The following are copies of the bills passed with this end in view in the House of 1888, being Caps. 24 and 32 :—

AN ACT TO PROVIDE FOR THE INCORPORATION OF CHEESE AND BUTTER MANUFACTURING ASSOCIATIONS.

Her Majesty, by and with the advice and consent of the Legislative Assembly of the Province of Ontario, enacts as follows :—

1.—(1) At any time hereafter, any five or more persons who desire to associate themselves together for the purpose of manufacturing cheese or butter, may make, sign and acknowledge before a notary public, commissioner or justice of the peace, in duplicate, and file in the office of the registrar of the registry division in which the business is to be carried on, a certificate in writing, in the form mentioned in the schedule to this Act, or to the same effect, together with the rules and regulations, signed by such persons respectively.

(2) The signatures to the rules shall be verified by the affidavit of a subscribing witness thereto, made before a notary public, justice of the peace or commissioner authorized to take affidavits, or before the the registrar or deputy-registrar.

(3) Upon the filing of the certificate and rules as aforesaid, the members of the association shall become a body corporate, by the name therein described, with the power to hold such lands as are required for the convenient management of their business.

(4) The registrar or deputy-registrar shall, if desired by the person filing the certificate, endorse on the other duplicate certificate and upon the duplicate of the rules certificates of the other duplicates having been filed in his office, with the date of filing, and every such certificate shall be *prima facie* evidence of the facts stated therein, and of the incorporation of the association.

(5) All rules made by the association may be repealed, altered or amended by other rules passed at a regular meeting called for that purpose, provided no such new rule shall have any force or effect until a copy, proved by the affidavit of the president or other head officer of the association to be a true copy of the rule or rules passed by the association at a meeting specially called for the purpose of considering the same, has been filed in the registry office in which the certificate of incorporation was filed.

(6) The association shall cause a book to be kept by the secretary, or by some other officer especially charged with that duty, wherein shall be kept,

(a) A duplicate of the certificate and of the rules filed as aforesaid in the office of the registrar, so that persons becoming members of the association may sign the said certificate and rules.

(b) Any person so desiring to become a member of, or a stockholder in the said association after incorporation as aforesaid, may sign the said certificate and rules in the said book and shall thereupon become such member, and he shall be entitled to the rights and privileges thereof, and shall become liable as such member as fully as though he had signed the certificate prior to the said incorporation of the association.

In furtherance of the Board's views, the Committee on Epidemics was instructed to draw up recommendations which were to be forwarded to Local Boards, with the request that these or similar regulations be adopted, regulating within their jurisdiction all public milk supplies. I am happy to say that the information obtained up to date indicates that Local Boards generally, are discussing them, and in a good number of instances adopting them. Like all other measures bearing upon the exercise of a supervision, which in order to be of any use must be constant, we recognise that it seems much easier to adopt a *laissez faire* policy; but the evidence from those places where active executive officers exist, goes to show that with the powers at their command it is surprisingly easy to effect a very great improvement both in the quality and cleanliness of these supplies, simply by making the license to sell dependent upon conformity with reasonable regulations.

OFFICE OF THE PROVINCIAL BOARD OF HEALTH,
TORONTO, November 28th, 1887.

To the Chairman and members of Local Boards of Health:—

GENTLEMEN,—As you are doubtless aware clause 5 of the Public Health Act of 1887 provides that: "The Medical Health Officer under the direction of the Local Board of Health shall have authority to make or cause to be made by a Veterinary Surgeon, or such other competent person as the circumstances may require, a periodic inspection of all dairies, cheese factories and creameries, dairy farms and slaughter-houses, which come within his or their jurisdiction"; and clause 6 of the same Act further places upon this Board the duty of enquiring into the various measures which are adopted by Local Boards throughout the Province in the interests of the public health.

2. No association shall be registered under a name identical with that by which any other existing association has been registered, or so nearly resembling such name as to be likely to deceive the public.

3. Any certificate so to be filed may designate any one or more places where the business is to be carried on; but if in different registry divisions, a duplicate must be filed in the registry office of each division.

4. A member of an association incorporated under this Act may have shares therein to an amount mentioned in the by-laws of the association not to exceed \$1,000.

5. Before an association commences operations under this Act, they shall agree upon and frame a set of rules for the regulation, government and management of the association, which shall contain—(1) a mode of convening general and special meetings; (2) provisions for audit of accounts; (3) power and mode of withdrawal of members; (4) appointment of managers and other officers and their respective duties, and a provision for filling vacancies caused by death, resignation and other causes.

6. The rules of every association registered under this Act shall bind the association and members thereof to the same extent as if each member had subscribed his name and affixed his seal thereto; and all moneys payable by any member to the association, in pursuance of said rules, shall be deemed to be a debt due from such member of the association.

7. The capital of the association shall be in shares of such denomination as mentioned in the rules.

8. The shares of the association shall be transferable subject to the consent and approval of the association.

9. All elections shall be by ballot, and each member shall have one vote for each share held by him, in respect of which he is not in default for any calls made thereon.

10. Every dispute between members or between members and the association established under this Act, or any person claiming through or under a member or under the rules of the association, and the directors, treasurer or other officers thereof, shall be decided by arbitration in manner directed by the rules of the association, and the decision so made shall be binding and conclusive on all parties without appeal.

11. The liability of the shareholders shall be limited, that is to say, no shareholder in such association shall be in any manner liable for or charged with the payment of any debt or demand due by the association beyond the amount of his share or shares subscribed for, and any shareholder having fully paid up the amount of his said share or shares shall be absolved from all further liability.

12. The fees to be charged by the registrar for filing any certificate shall be fifty cents, and for any search relating thereto ten cents.

SCHEDULE.

(Section 1 (1).)

FORM OF CERTIFICATE.

Province of Ontario, } We (insert names of subscribers not less than five) do hereby certify that we desire
TO WIT: } to form a company or association pursuant to the provisions of the "Act to provide
for the incorporation of Cheese and Butter Manufacturing Associations."
The corporate name of the association is to be (insert name of the association), and the objects for which
the association is to be formed are (insert objects for which the association is formed). The number of

In view therefore of the importance of the provisions contained in clause 5 of the Act already quoted, and of section 10 of schedule A of the Act of 1884, and owing to information received from time to time to the effect that no systematic inspection of public milk supplies exists in many municipalities in the Province, the Provincial Board recognizing the, now well-ascertained, dangers of the transmission of Typhoid Fever, Diphtheria and other infectious diseases by means of impure milk, has instructed its Committee on Foods and Adulterations to prepare for distribution to Local Boards certain recommendations, which it is hoped will form a basis for such regulations as the Local Boards of the several municipalities will deem proper to adopt. The fact that there are many rural municipalities, where there is no so-called public milk supply, will not, it is hoped, prevent their Local Boards from insisting, in the public interest, that the precautions which are deemed necessary for larger places, be carried out by those farmers residing in their districts who may be shippers of milk to cheese factories, creameries or to the large centres. In order that such inspections may be effective and systematic we have arranged in order the following regulations :

Reg. 1. All dairymen and vendors of milk shall, at least once a year, register with the Medical Health Officer, or Secretary of the Local Board, where no such Medical Officer exists, of the Municipality (in a register supplied by the Board for such purpose), (1) their names and addresses, (2) the source or sources of their milk supplies, (3) the number of cows in their possession, (4) the average quantity of milk disposed either (a) to milk shops, (b) milk vendors, (c) or to private consumers.

Reg. 2. That at such registration, a statement be made by all keepers of cows for public supplies as to the kind of foods supplied to their cows ; if (a) of brewers' grains, (b) distillery slops, (c) starch factory by-products, (d) ensilage or (e) oil-cake ; the amounts in proportion to the total food supplied.

Reg. 3. That periodic inspections be carried out under direction of the Board by its Medical Health Officer or Sanitary Inspector, in accordance with the spirit and provisions of sec. 3, Health Act, 1887, and sec. 10, schedule A, Health Act, 1884.

Reg. 4. That the dairyman or milk vendor agrees, as a condition of receiving license, to comply with the various clauses of the Health Acts, by giving notice to the Local Board of any cases of contagious animal diseases, (defined in clause of Public Health, 1887), occurring amongst his cattle, or of any scheduled contagious diseases in his family, or in the farm, house or shop at which, from which, or in which the milk is either sent or received, and that he further shall carry out the restrictions laid upon him by the Local Board under any Public Health Act.

shares is to be unlimited and the capital is to consist of shares of (*insert amount of shares*) each, or of such other amount as shall, from time to time, be determined by the rules of the association. The number of the trustees who shall manage the affairs of the association shall be (*insert the number of trustees*), and the names of such trustees are (*insert names of trustees*), and the name of the place (*or places*), where the operations of the said association are to be carried on is (*or are*) (*insert name of place or places where the operations of the said association are to be carried on*).

Dated the day of

(Signatures.)

On the day of A.D. 18 , before me personally appeared (*insert names of the subscribers to the certificate*) to me known to be the individuals described in the foregoing certificate and they severally before me signed the said certificate and acknowledged that they signed the same for the purposes therein mentioned.

A. B.,
Justice of the Peace, or
Commissioner for taking Affidavits, or
Notary Public.

AN ACT TO PROVIDE AGAINST FRAUDS IN THE SUPPLYING OF MILK TO CHEESE OR BUTTER MANUFACTORIES.

Her Majesty, by and with the advice and consent of the Legislative Assembly of the Province of Ontario, enacts as follows:—

1. No person shall knowingly and wilfully sell, supply, bring or send to a cheese or butter manufactory, or the owner or manager thereof, to be manufactured, milk diluted with water, or in any way adulterated, or milk from which any cream has been taken, or milk commonly known as "skimmed milk," without distinctly notifying, in writing, the owner or manager of such cheese or butter manufactory, that the milk so sold, supplied or brought to be manufactured has been so diluted with water, or adulterated, or had the cream so taken from it, or become milk commonly known as "skimmed milk," as the case may be.

2. No person who in the course of his business sells, supplies, brings or sends to any cheese or butter manufactory, or the owner or manager thereof, to be manufactured, the milk of cows, shall knowingly and wilfully, in the course of such dealing and business, keep back any part of the milk known as "strippings," without distinctly notifying, in writing, the owner or manager of such cheese or butter manufactory, of his having so kept back such "strippings."

3. No person shall knowingly and wilfully sell, supply, bring or send to a cheese or butter manufactory, or the owner or manager thereof, to be manufactured, any milk that is tainted, or partly sour, without distinctly notifying, in writing, the owner or manager of such cheese or butter manufactory of such milk being tainted or partly sour.

4. Any person who by himself, or by his servant, or agent, violates any of the provisions of the preceding sections of this Act, upon conviction thereof before any justice or justices of the peace, shall forfeit

Reg. 5. The milk vendor agrees to provide milk of a standard quality, the test values of each grade of milk to be as follows :—

GRADES.	SOLIDS.	FAT.
No. 1 Quality.....	14.00 per cent.	4.75 per cent.
No. 2 “.....	13.00 “	4.00 “
No. 3 “ ((Government minimum average).	12.00 “	3.50 “

Reg. 6. That the Local Board through its Medical Health Officer shall grant a yearly license to each dairyman, milk vendor and milk shop, after compliance of said person with the provisions of said regulations ; provided that at any time such license may be recalled on sufficient proof being had by said Board or its Officer of violation of the terms of the regulations, or of any clause of the Public Health Acts.

The following form for register is suggested :

FOR REGISTRY BOOK.

NAME.	ADDRESS.	LOCALITY OF SOURCE OF SUPPLY.	NO. OF COWS.	QUANTITY OF MILK SUPPLIED.		FOOD SUPPLY.	I hereby agree to report any infectious disease that may occur in my family, or in my house or shop, and whatever disease may occur amongst my cattle to the Medical Health Officer of this Municipality.
				To Dairies	To private people.		
							Date
							Signature.....

and pay a sum of not less than \$5 nor more than \$50, together with the costs of prosecution, in the discretion of such justice or justices, and in default of payment of such penalty and costs, shall be liable to be committed to the common gaol of the county, with hard labour for any period, not exceeding six months, unless the said penalty and the costs of enforcing same be sooner paid.

5. It shall be lawful for the owner or manager of a cheese or butter manufactory to require the owner or custodian of any cow or cows whose milk is being bought for, or supplied or sent to, the manufactory, to submit such cow or cows at his farm, or other premises, where such cows are usually kept, to such milk test, by persons named by such owner or manager, as may be necessary for the said persons to ascertain the quantity and quality of the milk of such cow or cows, on any day, and at such time on any such day as may be appointed by said owner or manager; and in case the owner or custodian of the cows refuses to so submit them, or obstructs in the execution thereof the persons engaged in making the milk test, or interrupts the test, or interferes in any way with the test, or the application of its result, he shall, on complaint before any justice or justices of the peace, forfeit and pay for every such offence a sum of not less than \$10 nor more than \$100, in the discretion of the justice or justices of the peace who may hear such complaint, together with the costs of prosecution, if so ordered, and in default of payment of such penalty and costs, shall be liable to be committed, by such convicting justice or justices of the peace, to the common gaol of the county, with hard labour, for any period not exceeding six months. or until said penalty and the costs of enforcing same be sooner paid.

6. It shall be lawful for the owner or manager of any cheese or butter manufactory, who suspects any person of selling, supplying, sending or bringing milk to the manufactory, of any offence under this Act, to enter upon or to appoint some person or persons to enter upon, and such appointed person may enter upon the premises of the suspected person, with or without notice, and take samples of milk from the cow or cows, from which the supposed offender was or had been immediately before then procuring the milk or part of the milk so sold, supplied, sent or brought as aforesaid, and any such suspected person who obstructs or refuses to permit the taking of any such sample shall, on conviction thereof, be liable to a penalty of not less than \$10 nor more than \$50 with costs of the prosecution, and in default of payment thereof, shall be liable to be imprisoned in the common gaol of the county in which the offence has been committed, for a period not exceeding three months with hard labour.

7. For the purpose of establishing the guilt of any person under the first three sections of this Act, it shall be sufficient *prima facie* evidence to shew that such person, by himself, his servant or agent, sold, supplied, sent or brought, to be manufactured, to any cheese or butter manufactory, milk substantially below the standard of that actually drawn, or by the accused represented as having been drawn, from the same cow or cows within the then previous week, provided the comparison or test is made [by means of a lactometer and cream gauge, or by some other adequate means of making the comparison.

8. Any penalty imposed under this Act shall, when recovered, be payable one-half to the informant or complainant and the other half to the treasurer of the local municipality in which the offence has been committed.

The following is similarly suggested for Form of License :

Mr. of
having agreed to conform with the terms of the regulations
 (Dairyman, milk vendor or shopkeeper.)
 printed herewith (on reverse side) is hereby authorized to engage in the business of dairyman, milk vendor or shopkeeper for the period, included between and , always providing that should any violation of any provision of the Health Acts or regulations be proven, as of the agreement to supply milk of a standard quality, neglect to keep premises in first-class condition as regards cleanliness, water used, etc., as required by said Local Board or its officer, or as regards infectious diseases, said license may at any time be cancelled.

Issued this.....
 day of.....

(Signed for Local Board)

It is hoped that the suggested regulations be instituted everywhere throughout the Province at the beginning of 1888 ; in order that this, of all sources of food the most important, may be supplied of the best possible quality, to the mutual advantage both of seller and consumer.

We have the honor to be,
 Your obedient servants,

FRANCIS RAE, M.D., Chairman,
 C. W. COVERNTON, M. D.,
 P. H. BRYCE, M.A., M.B., Secretary,

Members of the Committee on Epidemics.

Another matter calling for remark in regard to this, as of other contagious diseases, is the transportation of cases of diphtheria by railways from one place to another. This may be done either by transmission of the sick, or of the bodies of those who have died from the disease. Cases of the first kind occurred during the past year, one of these being from Ingersoll to Hamilton, others from point to point in the northern districts where lumbermen, etc., taken sick were sent to their homes in other parts by rail. The dangers resulting from occurrences of this kind are so well understood by even the general public, that reference to them in detail is quite unnecessary, but the law bearing on the point is often not fully understood or appreciated by even the physician, much less the ordinary citizen. As municipalities having had cases imported, have in indignation taken legal action for the punishment of offenders, I need hardly append here for reference those clauses bearing directly on the point. Hotels and other places of public entertainment are similarly great sources of danger, since persons away from home or in transit utilize them and many persons may thereby be unknowingly exposed to danger. Cases of this kind are constantly occurring, one being reported from Lindsay, where a patient was transferred to that town after having been lodging ill with diphtheria in a Kinmount hotel for a number of days. The physician who allowed this and his transmission to Lindsay was prosecuted. The many references made to the Board regarding this disease, amply attest its general prevalence and the dread in which it is held, as well as the fact that Local Boards are becoming more aroused to the necessity for taking prompt action along the various lines of action necessary for its limitation or suppression.

A point which, owing to the septic character of the disease, has been and we suppose will in some measure continue to be a difficulty in practice and a subject for discussion, is the length of time during which a person who has suffered from the disease is likely to be capable of transmitting it. During the past year several instances have occurred, in which mild cases, apparently free from exudation upon the respiratory mucous membrane have transmitted the disease to children after lengthened periods.

Speaking from personal experience with cases, and judging from the statements made by authorities such as Morell Mackenzie, I am inclined to the opinion that no fixed period can be given within which every case is dangerous and beyond which all are safe. It would appear to be clearly proved that the severity of the disease, the rapidity with which the virus is eliminated from the system, and the return of the respiratory tract to a healthy and non-infective stage, depends so largely on the constitution of the patient, the severity of the onset, the period at which the patient is seen, and the thoroughness of the measures taken not more for the treatment of the local affection than for the elimination of the virus from the system, that what would in practice be a perfectly safe period in one case for the mingling of a patient with other persons, would be highly inadvisable and dangerous in another. Doubtless this might be said with a certain degree of truth

regarding the eruptive fevers, but there appears to us to be in diphtheria so many distinctive points that we cannot do more than fix an arbitrary outside limit, and say that for general purposes this ought to be found perfectly safe. The skilful physician will likewise be the careful practitioner, and it is well that the general legal limit of isolation be fixed for instances where both treatment and nursing are likely to be defective. The necessity there is for your Board being positive in its opinions on these many points, is apparent from the constant references to your Secretary of points in dispute, and further, that he may be placed in a position to express the Board's opinion as expressed by approved regulations on the subject.

It will not seem improper to introduce at this point a further question on the matter of notification and isolation of disease. Assuming that the general law regarding notification is being everywhere enforced by Local Boards, the question of what is the best method by which the Board can secure isolation then comes up. In sparsely settled rural districts, or even in villages where each person has a small lot, the difficulty of isolating a family on the premises does not seem great, but when the parents or children, as in the families of workmen, have to leave their homes, pass through the streets, and be in communication with other persons, it is manifestly very difficult. The question of the advisability of enforcing perfect isolation in such instances comes up not only from the practical standpoint of possibility of enforcing it, but also from the humanitarian standpoint. If in the case of many an ordinary workman with a young family, it means that his work is stopped, his family through the successive sickness of four or five members becomes an object of municipal charity, and the house becomes an infected house for others coming into it. Until now, it is habitual to say, so hopeless is it found to prevent measles and scarlatina from spreading, that even careful townspeople are inclined to say, "They'll have it any way, so what is the use trying to keep them away from it."

Now it is manifest that so far our methods, as carried out in every day practice, practically fail to isolate. At date of writing, measles and whooping-cough exist in the family of a large retail butcher within fifty yards of my house. The family physician is a prominent city doctor. The wife of the butcher not only can be seen almost any time passing through or sitting in the store, walking the street in front of the house, carrying a convalescing child, while two or three more are playing on the boulevard with other children which may be about.

The public school hard by is half empty, so I am informed, through children being at home sick from these diseases, or for fear of them. If the previous conditions are allowed, there does not seem to be any use in closing the public schools. But this is not all. Several days ago I was consulted by a woman, sent to me as a last resort by a city physician, to see whether it was possible by any legal means, to obtain an entrance to the general hospital for the little girl who kept this woman's child while she went out to wash, the girl being ill with measles. She stated that she had sent her own child from the house, so that it would not take the disease, but was forced to pay two dollars a week for its keep. She stated that two other families lived in the same house, and had children, who, she felt sure, would be exposed to the disease. Not only were these the circumstances at home, but she also stated that she did not feel that she could go out or take in washing, for fear of spreading the disease into other houses, and how was she to live she asked?

I have verified as far as possible the details of the case, and it amply illustrates with the other facts as previously given, the statement that our attempts to control these diseases by any methods now in vogue in Toronto at least, utterly fail. I have become thoroughly convinced that until the city has advanced to the point of making notification both by householder and physician compulsory, under heavy penalties, we shall not greatly succeed; nor will this be of any great use until the method is adopted which is practised in many towns and cities of England, that of removing at once by a city ambulance, the first case in any house with its mother, if necessary, to a "House of Recovery," as isolated hospitals have been called there in many instances. Referring to this subject which is assuming such great practical development in England—much more indeed since the report of 1880-81 (from which I quote) was issued,—I quote regarding the City of Carlisle (pop. 35,000) isolation hospital. "During the typhus

We gather from this table several important facts. 1st. That for the five diseases which are reported in Hamilton, and which are taken to hospitals for isolation in Carlisle, that Hamilton with a population in 1886, one-fifth less than Carlisle, had twice as many deaths from the same five diseases. 2nd. That the single disease, whooping-cough, which is not isolated in Carlisle, caused as many deaths as all other zymotics together, whereas in other towns in England, where measles is classed in the same manner as whooping-cough, it causes usually, as many, or more deaths than whooping-cough. 3rd. That diphtheria in an old city, where contaminated soil, etc., ought to exist to a much greater extent than in Ontario, exists to a very small extent; while in Hamilton, it has persisted to a comparatively enormous extent, though 1887 has shown a very decided decrease. 4th. That the mild forms of measles and scarlatina have become in more recent years the rule in Ontario, while probably climatic causes make the type more severe in England. 5th. That notification even where thoroughly carried out has no notable influence in checking outbreaks of disease, unless associated with house inspection and strict isolation in them or elsewhere. 6th. That the house isolation is usually ineffectual to limit the disease to the first case in the house.

So strongly have these many facts impressed themselves upon your Secretary, that he has felt it his duty to inculcate the establishment, wherever the opportunity has presented itself, of an isolation hospital for the reception of cases of contagious diseases, and notably of diphtheria, which is and has been in Ontario and neighbouring states for years a growing pest. Its contagious character is so certainly established as to require no further argument, while the permanency of the special cause when once introduced into a house is beyond all dispute. For instance, in a recent epidemic in Whitby, it was found that 29 scholars in succession in a single class-room of 60 scholars had taken ill with the disease, 13 of whom had succumbed to it. Doubtless, the prime cause was the return to the class-room of children before their throats had become non-infectious, and whose clothing had not been disinfected, and washed in some instances; but granting these as first causes, the particles from their clothing and their exudats would have infected the air of the room into which the dust as is usual was stirred up frequently during sweeping. The town authorities at once supported the idea of an isolation house being fitted up for the reception of first cases of diphtheria, as being at once an economical method for stamping out the disease, their experience during the past year having proved the inutility of any other methods. The authorities in frontier townships, as those in the Nipissing and Haliburton districts, where diphtheria has prevailed even where settlement is sparse, with epidemic virulence have been forced by sad experience to admit that all attempts at house isolation have been a failure. Dr. Currie, of Minden, an old and experienced Medical Health Officer is authority for the statement, that on one concession line every household with the exception of two had had cases of diphtheria, and the two that escaped, did so by non-communication, they not being acquainted with the others. At Haliburton village a house was set apart as an isolation hospital last year, and the outbreak was promptly stamped out. Popular prejudice believed in the persistent character of the virus of diphtheria since, shortly after the patients had convalesced, the house was burnt down under cover of the darkness, thereby illustrating disinfection by fire.

While in the small houses of settlers, as in those of the working-classes in towns and cities, the certainty of the spread of the disease to those liable to take it, has been proven in hundreds of cases, the ease with which, with thorough precautions the disease may be limited to a single ward of a hospital, makes the propriety of having such isolation hospitals everywhere established, very apparent. Toronto has the matter under consideration. Guelph has an infectious wing, while other places have at times made temporary provisions. But all evidence as in London, regarding scarlet fever, shows that to be successful the arrangements must be perfect, and that it is the capture of first cases in an outbreak which insures success. I quote the following from a recent report from the *Sanitary Record*, re value of notification and isolation, "Of evidence of the value of notification and hospital isolation, especially in the case of small-pox and typhus in Salford, no fewer than seven separate importations of the former disease and six of the latter have taken place since the Notification Act was passed five years ago, and yet

in no single instance has either of these diseases gained a foothold in Salford ; whereas, in the five preceding years, before notification was compulsory, those diseases invariably spread and caused a serious amount of mischief. In Huddersfield, the procedure adopted by Dr. J. S. Cameron is much the same as in Salford, and the results are eminently satisfactory. The medical profession have loyally carried out the Act, and the public seem also, as at Salford, to be gradually grasping the requirements and advantages of notification. When a case of Scarlet Fever occurs in a non-infected district, the health officers all unite to work backwards to its cause, proceeding on the assumption that it is due to infection. In some cases they get a hint from the friends of the patient that they suspect some of their neighbours of harbouring a concealed case. In one instance, from a hint received, Dr. Cameron sent the Inspector to visit every house in a certain neighbourhood, and was the next day able to send nine cases from two houses, one of them that of a tailor, into hospital."

If it is any satisfaction to our Ontario people, I would state that in our views on the question of isolation hospitals, our authorities and people are greatly in advance in their views on the subject, of the people of most States of the Union. The so-called liberty of the citizen—one could perhaps more correctly express it, the respect for his vote—seems in the eyes of many to be an insuperable obstacle to thorough isolation work. We have much in the working out of details yet before us, but as is evinced by the reports of municipalities herewith published, great advances in many places are abundantly shown.

II.—DESTRUCTION OF TOWN REFUSE.

As a practical measure most closely allied to the work of isolation and disinfection which, as has been observed, Local Boards have constantly to deal with, is that of how best to deal with the inevitable accumulations of organic refuse, *e.g.*, the contents of dust-bins, street sweepings and the remains of animals which have died in our towns and cities. In many cases not hitherto crowded. Such disposal has been left to the sense of decency of the persons to whom such refuse pertained ; but except in Toronto and a few other places no regular system of scavenging for the weekly removal of refuse has been instituted. One reason for this has been the difficulty in finding some satisfactory method for disposing of such refuse, which would not create a nuisance at the dumping ground. The filling in of vacant lots with street sweepings is in many cases well enough, but when such deposits contain in addition offal of the filthiest description the good attained is often as doubtful as the procedure is unbecoming and unsanitary.

The cities of Great Britain have, with their increased necessities and in their usual thorough fashion, been dealing with the question of refuse destructors, and have, we may say, practically solved in many instances a very difficult problem. During 1888 the Local Government Board issued instructions to Thomas Codrington, M. Inst. C. E., the engineering inspector of the Board, to report on the different methods of destroying town refuse, and for twelve months Mr. Codrington was engaged in visiting all those towns where such works have been established. For the purpose of supplying to our Local Boards the most recent practical and effective methods of dealing with this all-important question I propose to make copious extracts from this work, which represents the most perfect methods in use at the present time.

Thus says Mr. Codrington : Town refuse, consisting of the contents of ash-pits and dust-bins, market and trade refuse, and the sweepings of paved streets, includes materials which, when sorted out and separated, may yield a small return, or can be utilized in some way. But this part of the refuse has, from various causes, lost much of whatever value it formerly had, and the sanitary objections to the handling of an offensive material for the sake of a small gain are now more generally recognized. It has also become more and more difficult to get rid of that part of the refuse which is absolutely worthless. The practice of filling up pits, quarries and hollows with materials containing offensive and putrescible matters, sometimes afterwards to be built on, is now properly condemned on sanitary grounds, and town authorities, when places for deposit within their own boundaries are no longer available, find neighbouring authorities more and more averse to

allow refuse to be accumulated within their districts. The disposal of town refuse has thus become almost everywhere a troublesome question.

Composition of Town refuse.—In towns in which water-closets are general, the house refuse consists of cinders and ashes mixed with vegetable and animal waste, broken glass and crockery, and the rubbish of all sorts that finds its way into the dust-bin or ash-pit, including often trade refuse and garden refuse in greater or less proportion. In some towns the trade refuse, market garbage and the sweepings of paved streets amount to as much as the house refuse. The trade refuse consists of coarse paper, straw, shavings, broken stoneware and glass, engine ashes, brick rubbish, spoilt fruit, fish and tinned provisions, etc. Market refuse is strictly the animal and vegetable matters removed from markets, but it is often mixed with other refuse, and, generally speaking, the different sorts of town refuse can only be roughly classified.

The annual reports of Mr. G. Weston, the Surveyor of the parish of Paddington, give the constituents of the dust collected from a population of about 112,000, and they may be taken as giving the fair average composition of London town refuse. In 1886, 20,600 tons of "dust" were collected, and the materials, when sorted out, were in the following proportions per 1,000 tons. Other years give much the same results.

London Refuse.	Per 1,000 Tons.
Ashes.....	526
Breeze (cinders).....	288
Soft core (animal and vegetable refuse).....	142
Hard core (broken pottery, etc.).....	29
Coal.....	1½
Bones.....	2½
Rags.....	4½
Old iron.....	3½
Old metals (brass, pewter, etc.).....	½
White glass.....	½
Black glass.....	2¼
Tons.....	1,000

In the dust yards in and around the metropolis the ashes and breeze or cinders are sifted out and sold to brickmakers, and from the residue all that is saleable is picked out, leaving the hard core and soft core to be got rid of, which is generally accomplished by carting or barging or sending it away by railway. Some of the hard core is used for road foundations, and the soft core is sometimes mixed with garbage and street sweepings and sent away as farm manure.

Where the privy-and-ash-pit system, or the pail-system, is in use the finer ashes are mixed with the excreta, either in the closet or subsequently, to make a portable manure, and the contents of the ash pits are generally more or less fouled with excrementitious matter. In Manchester, where pail closets prevail, of 1,000 tons collected from the closets and ash pits in 1880, the constituent parts seem to have been as follows* :—

Manchester Refuse.	Per 1,000 Tons.
Ashes and excreta in pails.....	645
Dust and cinders.....	345½
Fish and bones.....	1½
Dogs, cats, hens, rabbits, etc.....	½
Boots, rags, hats, paper, etc.....	½
Vegetable refuse.....	½
Glass, pottery, bricks, etc.....	6
Old iron and tin ware.....	½
Tons.....	1,000

* Detailed statement of refuse collected for year ending August 31, 1880, by Mr. Henry Whiley.

For every 1,000 tons collected from the closets and ash-pits, about 290 tons of slaughter-house, market and shop refuse and street sweepings were besides collected, the whole being about 250,000 tons.

There is considerable difference in the nature of town refuse under different circumstances. Where coal is cheap a larger proportion of cinders and unburned fuel might be expected, but this is not always the case. People who burn their own coal are generally less wasteful than a higher class population at the mercy of servants, and this is often shown in different quarters of the same town. The superintendents from several large towns who visited with me a dust yard near the west end of London expressed surprise at the large quantity of cinders and coal in the refuse. In Glasgow, on the other hand, there is said to be most cinders in the ashes from the poorer classes of the city. In summer the quantity of vegetable refuse is larger, and there is less of cinders and ashes, so that the refuse is damper than in the winter. Where uncovered ash-pits are allowed, the contents get sodden with wet in rainy weather, especially if they are not cleared frequently.

Weight.—A cubic yard of ordinary refuse weighs from $12\frac{1}{4}$ to 15 cwt. Shop refuse lighter, sometimes weighing as little as $7\frac{1}{4}$ cwt. per cubic yard. A load, by which refuse is often reckoned, varies in weight from 15 cwt. to $1\frac{1}{2}$ tons.

Quantity of town refuse.—The quantity of town refuse collected appears to range from 200 to 300 tons per year per 1,000 of population, and of this whatever cannot be utilized has to be got rid of.

Disposal of refuse.—Some towns, whose situation admits of it, send their refuse to sea and deposit it in deep water. Liverpool employs two steam hopper barges of 350 tons burden each, and sends yearly about 89,000 tons of refuse, not to be otherwise got rid of, 11 miles outside the bar of the Mersey. Dublin, in 1885, sent about 36,000 tons of unsaleable refuse to sea in a similar manner, and Sunderland and other seaside towns adopt the same course.

Plate I.—At Paddington furnaces similar to those which are shown on Plate I. were erected, and the plan has been followed ever since. The cells or combustion-chambers are arranged in groups of four, back to back; they are each 8 ft. 6 in. long, 4 ft. 3 in. wide, and 6 ft. 3 in. high from the fire-bars to the crown of the arch. The bottom slopes upwards 1 in 6 from the furnace doors, and consists of a length of 5 feet of fire-bars and 3 feet of hearth, beyond which there is a step or bridge 2 feet high, over which the products of combustion pass into a descending flue to an underground flue leading to the chimney. The furnace is made high to prevent burning the arch, and the fire-brick lining at the sides is independent of the walls. The refuse is fed into an opening over the middle of the furnace, and thus into the hottest part of the fire, without any attempt at previous drying.

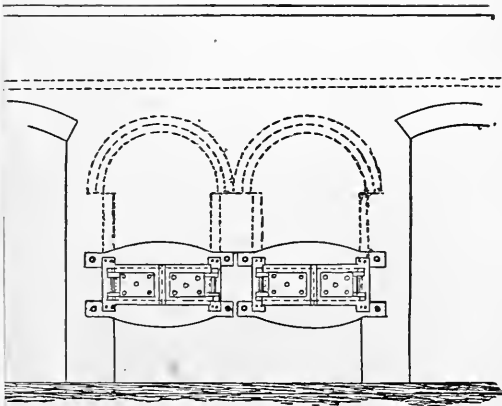
The furnaces shown on Plate I. have been in use at the Water Street depot since 1877. Two blocks of four furnaces were in operation in 1886, and another similar block has lately been added, making in all 12 furnaces. An inclined road leads to a platform level with the top, on to which the refuse is tipped, and which is covered by an iron shed roof.

The material burned consists of what remains of the ash-pit refuse, after the fine ashes and part of the coarser cinders have been separated by screening, the former to be mixed with pail contents, and the latter to be burned under two 40 horse-power Lancashire boilers, and raise steam for driving the machinery. At the Holt Town Works there are four of these furnaces which consume such rubbish as cannot be burned under the boilers (of which there are twelve), with the aid of a little coal, for evaporating and concentrating excreta, and to work the necessary machinery. Great care is taken to feed the furnaces and to remove the clinkers, which are produced by burning with regularity. A table is painted up at each furnace, setting out the times at which it is to be clinkered, at intervals of $1\frac{1}{2}$ hours day and night, and so arranged that two furnaces are clinkered in rotation every quarter of an hour. The furnace men attend to the feeding as well as to

Plate 1.

- a. a. Feed Holes.
- b. b. Furnaces.
- c. c. Cold Air Inlets.
- d. d. Air Spaces
- e. e. Fire Doors.
- f. f. Flues

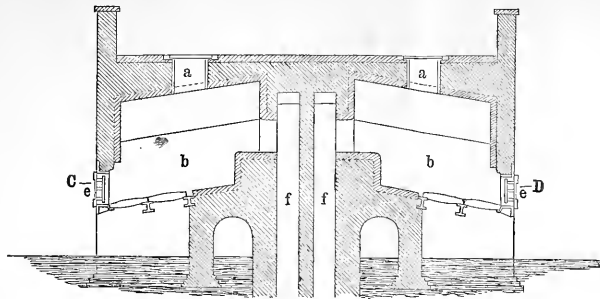
Elevation.



MANCHESTER.
DESTRUCTOR FURNACE,
1877-1887.

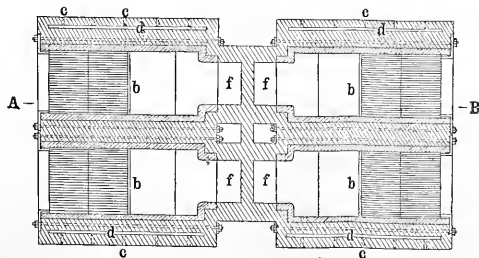
Plate I

Section at A.B.

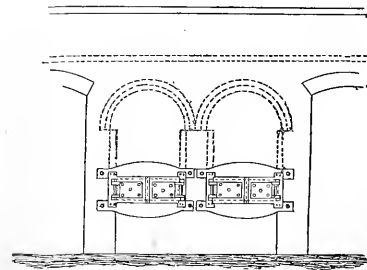


- a. a. Feed Holes.
- b. b. Furnaces.
- c. c. Cold Air Inlets.
- d. d. Air Spaces
- e. e. Fire Doors.
- f. f. Flues

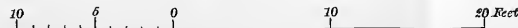
Plan at C.D.



Elevation.



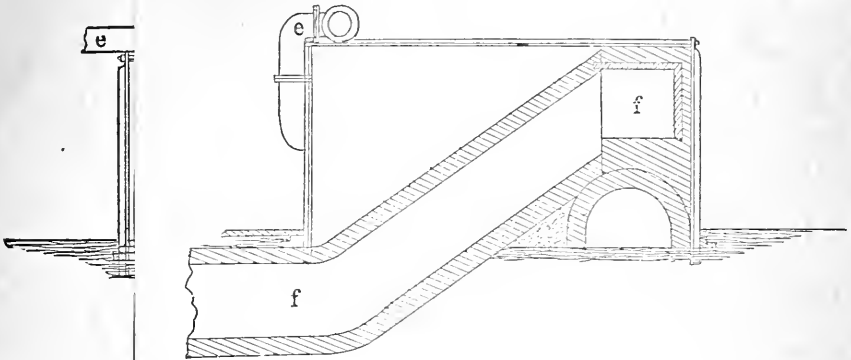
Scale 8 Feet to an Inch.



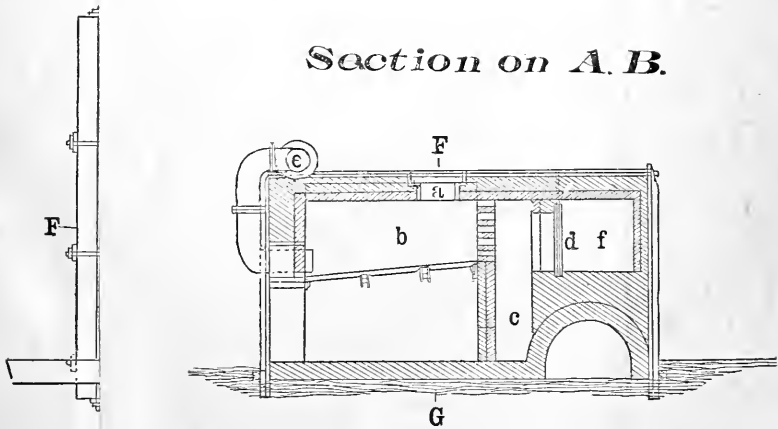
ARF.

H

Section on D.E



Section on A.B

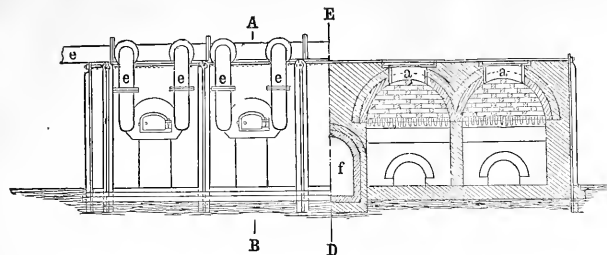


BIRMINGHAM.

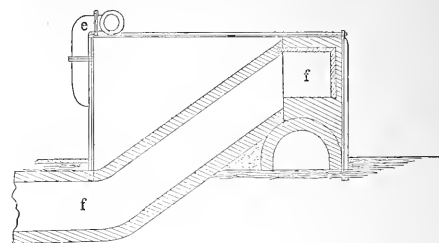
Plate 2

MUFFLE FURNACES AT MONTAGUE ST. WHARF.

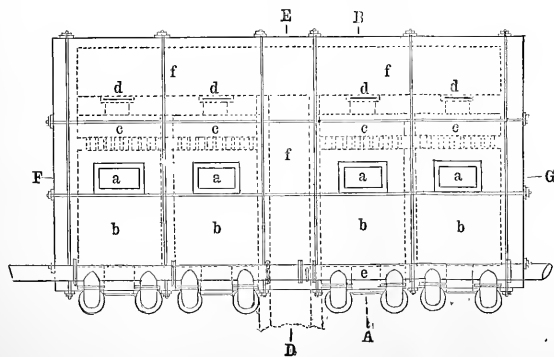
Half Elevation. Half Section on E G



Section on D. E

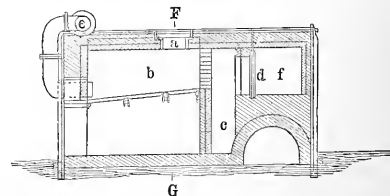


Plan at Top.



a. a Feed Holes.
b. b Furnaces
c. c Dust Chamber,
d. d Dampers.
e. e Foul Air Main.
f. f Flues.

Section on A. B.



the clinkering, and both operations go on with the same regularity. For the eight furnaces at Water Street four men are employed by day and four by night, besides a man by day and one by night to assist in feeding. The boiler furnaces are fed and clinkered with the same regularity every $1\frac{1}{4}$ hour, so that of the eight furnaces and four boiler furnaces in use at Water Street one-half to two-thirds are always burning with hot clear fires, the hot gases from which mix in the main flue with those from the newly charged furnaces and effectually burn them. The temperature in the furnaces was found by Mr. Darley, Smoke Inspector of Leeds, to average 625° Fahr. Very little smoke is emitted from the chimney, which is 138 feet high.

A trial made with the eight furnaces at Water Street showed that they consumed 226 tons of refuse in a week of 132 hours, or $5\frac{1}{2}$ days, being at the rate of $28\frac{1}{2}$ tons per furnace per week, or 5 tons 2 cwt. in 24 hours, the great-area being $21\frac{1}{4}$ square feet. The clinker and ashes produced were nearly one-half by weight of the material burned. The clinker is used for making mortar, for which purpose there are five mortar mills with edge runners, and the fine dust from the flues is mixed with carbolic acid and made into disinfecting powder.

Birmingham.—At Birmingham a four-cell Fryer's Destructor was erected at the Shadwell Street wharf in 1877, with concretors for concentrating excreta and a carbonizer for vegetable refuse. In consequence of complaints from the General Hospital, which is only separated from the works by a canal, the use, first of the concretors, then of the carbonizer, and finally the destructor, was discontinued. Subsequently, alterations were made in the furnaces of the destructor, and feed-openings were made in the middle over the upper end of the fire-grate. So altered, the furnaces are now worked as much as possible by night, and burn 5,600 tons of refuse a year, after the fine ashes have been sifted out for mixing with excreta for manure, without complaint from the hospital.

Plate II.—At the Montague Street wharf the contents of the ash-tubs are carried by an elevator to a rotating screen, by which the fine ashes are separated and passed through a hopper and pipe to a pug-mill, where they are mixed with excreta from the pails. The mixture is delivered into barges and sold for manure. The greater part of the cinders and the rubbish is burned under-steam boilers for drying excreta, and the residue, including the more offensive refuse, is burned in furnaces designed by Mr. J. Wilkinson, and shown in Plate II. They are four in number, each 7 ft. 4 in. long and 5 ft. 4 in. wide; the fire-grate occupies the whole of the bottom, and rises with an inclination of 1 in 10 towards the back. The covering arch is 3 ft. 3 in. high at the fire-door and has a feed-hole in the top towards the back of the furnace. The latter consists of a pigeon-holed wall of fire-brick 9 inches thick, presenting a large headed surface to the vapours as they pass off. Beyond is a dust chamber 1 ft. 6 in. wide, and extending to the level of the ground, with an opening into the ash-pit, closed by loose bricks, which are removed when the dust is cleared out. An opening, fitted with a damper, leads from the dust-chamber to the flue, which is level with the furnace, and is connected with the chimney by a descending flue.

The gases from the drying excreta are extracted by blowers and passed into the furnaces through pipes, entering on each side of the fire-door. Gases which had a most offensive smell on entering the furnace, when taken from the base of the chimney were found to be odorless.

The furnaces are fed principally from the top, though sometimes by the fire-door as well. The fire is pushed to one side of the furnace and to the back, exposing the clinker, which is lifted from the fire-bars and raked out. The fire is then spread evenly, and a fresh charge is thrown in upon it. The furnaces are banked on Saturday afternoon and left till midnight on Sunday, thus burning continuously about 132 hours a week. They are said to be capable each of burning six tons of ordinary refuse in 12 hours.

The chimney is 260 feet high, serving for 15 boilers as well as the four furnaces. A little smoke of a light colour is all that is visible at the chimney-top. The clinker obtained from the burned refuse is used for making mortar, concrete paving, coping, etc., as well as for street foundations.

The cost of the furnaces was about £120 each, and that of the chimney about £1,000. One man by day and one by night work the four furnaces, and the labour costs about £2 12s. per week.

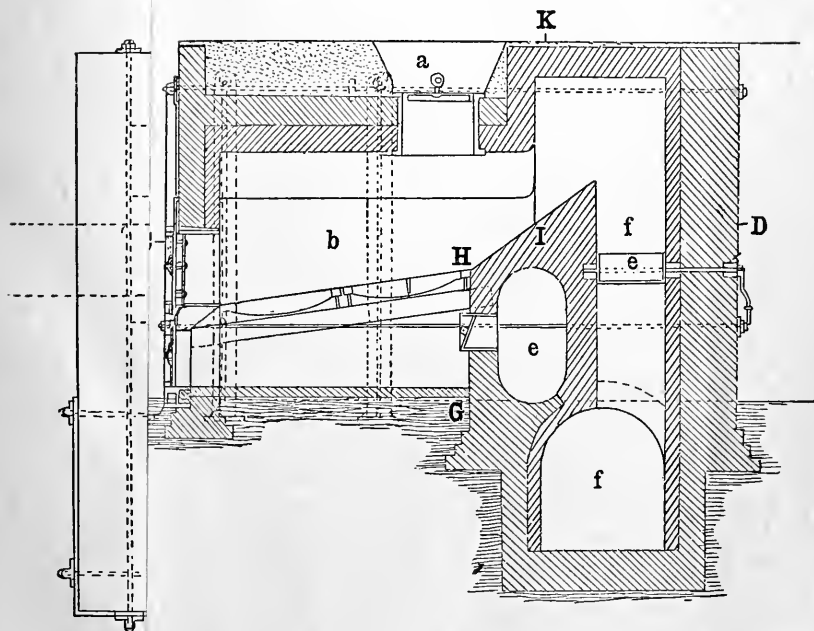
Plate III.—The furnaces at the Crawford Street Works, which are shown on Plate III., are two in number, each 12 feet wide, the whole width being occupied by the fire-grate, which is 7 feet long, and rises towards the back with an inclination of 1 in 7. At the front of the furnace the height of the covering arch is 4 ft. 3 in. above the fire-bars. There are two furnace doors, 3 feet wide, to each furnace, and two outlets, each 4 feet wide, sloping upwards from the back of the fire-grate, and then turning downwards to the main flue. The ash-pits are closed by doors, and the foul air is exhausted from the excreta-tank and mixing chamber by a fan, and forced into the back of the ash-pit and through the fire. The two furnaces form a block 28 ft. 6 in. by 15 ft. 8 in. and 10 ft. high, the top forming the bottom of a pit in the upper floor of the building, about 6 feet deep, into which the rubbish to be burned is delivered, and is fed into the furnaces through two openings over the upper end of the fire-grates. A large charge is put in when the fire is clear, and the feed-hole is closed by a cover. The clinker is withdrawn every two hours. The furnaces are banked up at about mid-day, by which time the rubbish collected in the previous night is nearly all burned, and 11 p. m., when the refuse begins again to arrive, the fires are started with old baskets, etc. The quantity of refuse burned at the Crawford Street Works in 1886 was about 11,000 tons, an average of 210 tons per week, but in November as much as 396 tons per week were burned. About one-fourth by weight is left as clinker, which is conveyed to tips by rail.

At St. Rollox Works, constructed earlier, there are five furnaces of a similar character, all 6 ft. from back to front, but varying in width from 6 ft. to 12 ft. About the same quantity of refuse is burned as at Crawford Street. The chimney is 50 yards high, that at the Crawford Street Works being 80 yards. The main flues are cleared every two months of a fine dust, which at Crawford Street amounts to about 6 cubic yards. There are no complaints of dust or smell from the chimneys, which both emitted a light greenish yellow smoke. In the main flue at Crawford Street a grid with $\frac{3}{4}$ inch spaces, kept cold by water passing through it, has been fixed to catch charred paper, which at first escaped from the chimney-top.

Fryer's Destructor.—*Plate IV.*—Fryer's destructor, the general arrangement of which was patented by Mr. Alfred Fryer, of the firm of Manlove, Alliott and Fryer, in 1877, is shown on Plate IV. It consists of a group of furnaces or cells, each internally about 9 ft. long and 5 ft. wide, covered by a fire-brick arch 3 ft. 6 in. high. The furnace has an inclination of 1 in 3 from back to front, and the bottom consists of a fire-brick hearth for the upper 4 ft. and a fire-grate for the lower 5 ft. On one side of the furnace the upper end of the hearth is prolonged with a steeper slope under an opening for the admission of the refuse from above, and on the other side is a passage whereby the products of combustion pass downwards to the main flue, a wall in the middle line of the furnace dividing the feed-hole from the flue-opening. The main flue is under the hearth, and in the later destructors, is made of large size to form a dust-chamber. The cells are perferably placed back to back with the feed-holes adjoining, there being only one opening above for the two cells. A somewhat larger opening, fitted with a cover, is provided over the middle of one or more of the furnaces through which infected bedding, condemned meat, etc., can be consigned to the hottest part of the fire. This opening might with advantage be made larger, as it is difficult to get in a mattress without cutting it up. There are cast-iron furnace mouths, with fire-doors at the front of the furnace. In the earlier destructors there were two mouths to each cell, but now one mouth, 5 ft. wide, with a door hinged at the top to open upwards, with balance weights, is preferred. The furnaces and flues are lined throughout with fire-brick, and corner pieces, stays, and tie-rods hold the brickwork together. A furnace or cell with the enclosing brickwork forms a rectangular mass about 12 ft. long, 7 ft. wide, and 12 ft high, a group of four cells back to back measuring about 14 ft. by 24 ft., and a group of six cells about 21 ft. by 24 ft. A

- a.a. Feed Holes,
 b.b. Furnace.
 c.c. Damper.
 d. Air Space
 e.e. Foul Air Flue.
 f.f. Flues.

Cross Section on A.B.

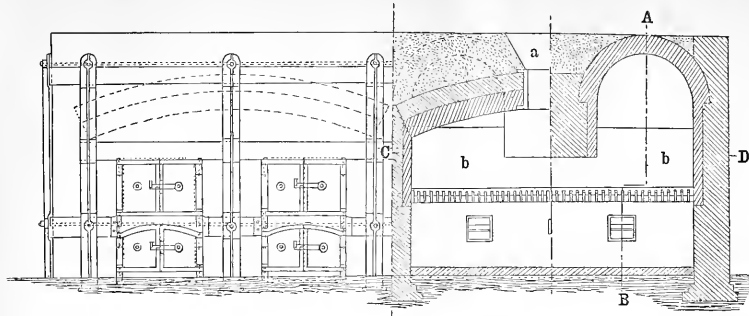


GLASGOW.
—CRAWFORD ST. WORKS.—
RUBBISH FURNACE.

Plate 3

Elevation

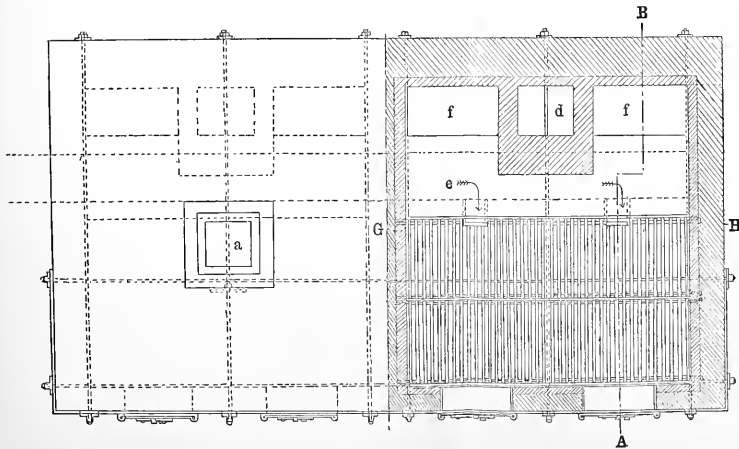
Section on G H I K.



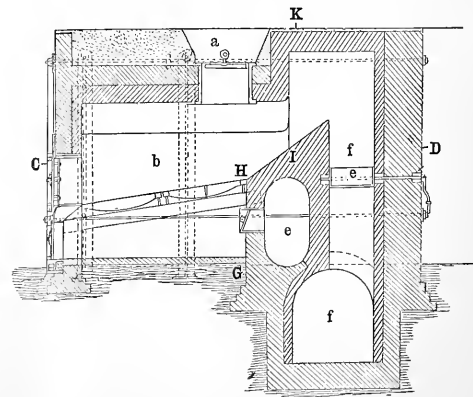
a.a.Feed Holes,
b.b.Furnace.
c.c.Damper.
d. Air Space
e.e.Foul Air Flue.
f.f.Flues.

Plan at Top

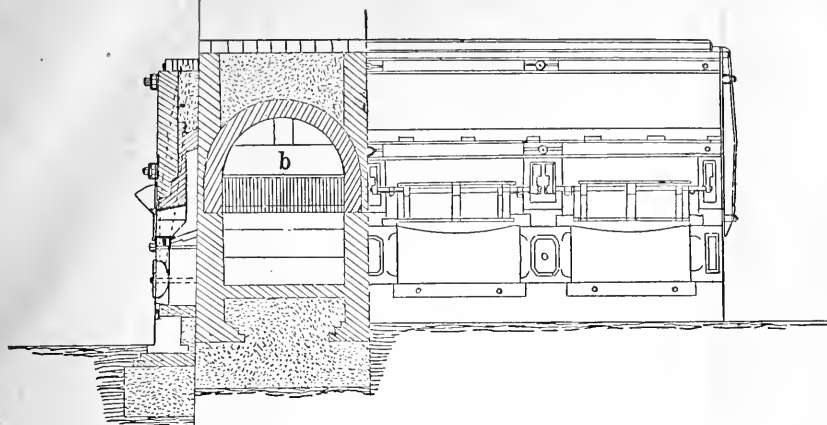
Plan at C,D.



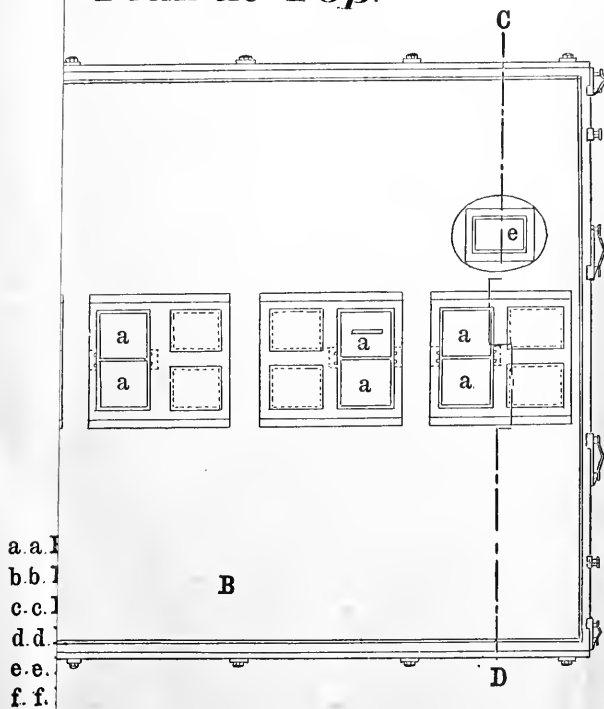
Cross Section on A,B.



on A. B. Elevation.



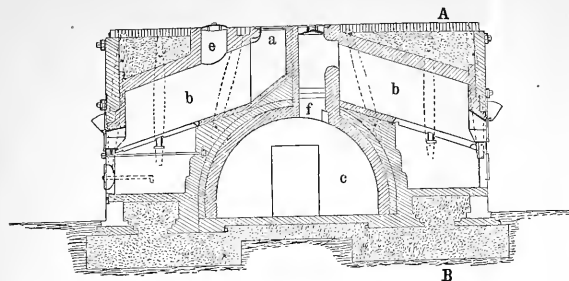
Plan at Top.



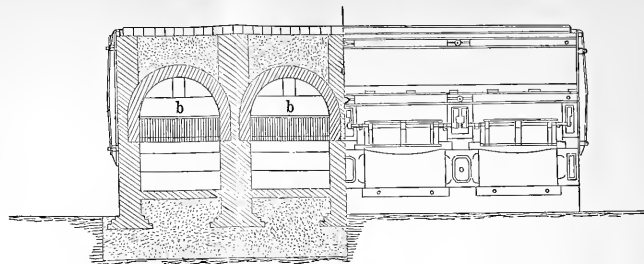
FRYER'S DESTRUCTOR.

Plate 4

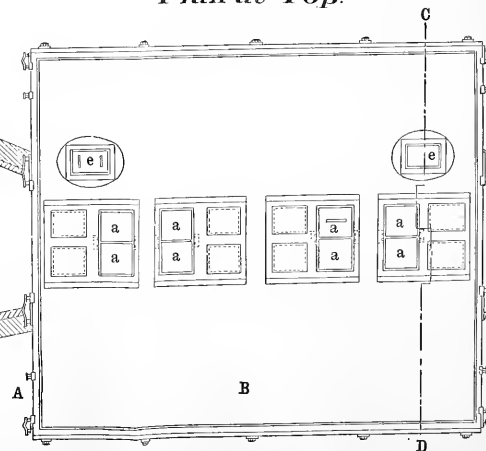
Section on C D



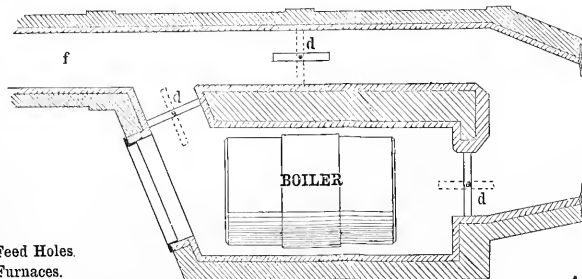
Section on A B. Elevation.



Plan at Top.



Sectional Plan of Flues.



- a. a. Feed Holes.
- b. b. Furnaces.
- c. c. Dust Chambers.
- d. d. Dampers
- e. e. Mattress Holes.
- f. f. Flues.

road is generally made by which the refuse is carted to a platform 2 ft. 6 in. or 3 ft. above the destructor, and another leading to the ash-pit floor for the removal of the unburned portion of the refuse. In a few cases the refuse is raised to the top of the destructor by a lift or elevator, but a road for carts is far better.

The feed-openings at the top of the destructor are kept filled with refuse, which slides forward on the sloping hearth, and is partially dried by the heat given out by the burning material, and reflected from the reverberatory arch. It is helped forward by raking till it reaches the fire-grate, when everything combustible is burned to a hard clinker, which is withdrawn from time to time through the furnace doors.

The hot gases, or a portion of them, are usually passed through a multitubular boiler to make steam to supply an engine to work mortar-mills and other machinery. The chimney shaft is usually at least 120 ft. high, and sometimes as much as 180 ft., to create a keen draught and carry off all offensive fumes, and the lower part is generally furnished with a fire-brick lining, with an air space for a height of 30 to 70 feet.

The clinker is removed about every two hours. It is lifted from the fire bars and raised above the burning cinders with suitable tools, and raked out of the furnace with any other thoroughly burned refuse. The fire is then spread evenly over the grate, and dry refuse is raked forward from the back sufficient to cover the fire evenly with a thickness of about four inches. When the refuse is wet, a less thickness is enough. If too much refuse be drawn down at one time, the fire will become dead and black. At intervals of about twenty minutes, another thin layer of refuse may be raked forward and spread over the fire, but it is best to leave the fire undisturbed for half an hour before clinkering. The fire-bars must always be kept covered, but the fire should not be too thick; 7 to 9 in. is quite enough to ensure a clear bright fire. There should be enough refuse over the feed hopper to prevent air entering, but not so much as to prevent the proper charging of the cell, and there should be always sufficient refuse on the drying hearth ready to be raked forward for burning.

Leeds.—Destructors of this sort have been in continuous operation at Leeds since the beginning of 1878, when a six-cell destructor was completed at Burmantofts, $1\frac{1}{2}$ miles from the centre of the town, to the north-east. In the following year another destructor of six cells was erected at Armley Road, about a mile to the west of the town hall. In 1882 four more cells were added to each destructor, and in 1887 two more cells were added at Armley Road. In both destructors the cells are arranged back to back over a main flue which, when the additional cells were added, was widened to 10 feet. The main flue branches into a bye-pass and a flue for heating a boiler, and the passage to one or the other is regulated by dampers. At Burmantofts the gases heat a multitubular boiler 10 ft. long and 6 ft. in diameter, which supplies steam to an engine having a 12 in. cylinder, and 2 ft. stroke, which drives two mortar mills, with pans 8 ft. in diameter, and 27 cwt. rollers. These are on the ground floor. An incline of 1 in 14, laid with cast-iron tram-plates, leads to the upper floor, which is 15 ft. above lower floor, and 3 ft. above the top of the destructor. The lower floor is open on two sides, but the upper floor is closed in and roofed over. The chimney is 150 ft. high and 5 ft. in internal diameter; it was built when the additional cells were added, the old colliery chimney used before being too small.

At Armley Road the chimney is 120 feet high and 6 feet internal diameter, and the building is of iron, 70 feet by 50 feet, supported on iron columns. A floor or platform of brick arching on plate-iron girders is reached by a road ascending 1 in 12, and another road leads downwards to the firing floor. The boiler is 9 ft. 2 in. long and 8 ft. in diameter, and the engine has a 14-inch cylinder and 30-inch stroke, and drives two mortar mills 9 feet in diameter.

The clinker from the furnaces is estimated at about one-fourth by weight of the refuse burned, but some tests by Mr. Newhouse, the superintendent of the Sanitary Department, showed the proportion of clinker and ashes to be one-third. Mortar is made of as much of it as there is a sale for, and the rest is used for ballast, street foundations, etc. The old iron and tin which is picked out and sold unburned fetches £1 a ton on

account of the solder, but the greater part goes through the destructors, and is sold for about 5s. a ton.

The total cost of the destructors, buildings, offices, machinery, etc., as stated in a report from the Chairman of the Sanitary Committee and the borough engineer, has been—

	£	s.	d.
Burmantofts destructor, 10 cells.....	7,282	1	1
Armley Road destructor, 10 cells.....	7,466	9	10

This includes the cost of a carbonizer no longer used, and other things not strictly appertaining to the destructors which it is impossible to separate.

The labour required at each destructor station is,

- 1 foreman, who acts as engine driver.
- 6 furnace-men, working three in day and three in night shifts.
- 1 labourer attending to mortar mills.

Considerable care is now taken with the charging and clinkering of the furnaces. At first all the cells were clinkered and charged one after the other every $2\frac{1}{2}$ hours, as quickly as the men chose to do it, but now a pair of cells are charged every 25 minutes regularly. The result is that the temperature in the main flue is more uniform, and there is less smoke from the chimney.

The fires are kept continuously alight except when drawn for repairs; the furnaces are filled up and banked about 1 p.m. on Saturday, and the damper is closed at 7 p.m. till 12 on Sunday night. The amount burned in the year ending 31st August, 1886, in the 20 cells was 35,248 tons, giving an average of 34 tons per cell per week, consisting of refuse from ash-pits with trade and market refuse. Mr. J. Newhouse furnished the following list of other things destroyed during the same period:—

Eleven cows, 3 calves, 17 sheep, 4 goats, 298 pigs, 5 turkeys, 2 carcasses of beef, 28 quarters of beef, 9 cwt. of pork, 10 cwt. of pickled tongues, 12 cwt. of herrings, 218 cwt. of shell fish, 1 cwt. of sugar, 285 dogs, 109 cats, 13 foxes, 1 sea serpent, 147 mattresses, beds, pillows and bolsters; 7 blankets, quilts and sheets, 36 pieces of carpet, 7 hearth rugs and mats, 33 pieces of wearing apparel, 1 bedstead, 1 sofa, 1 chair and 1 bundle of rags.

This is not an unusual year's work, and the destruction of diseased animals and condemned food is constantly effected without offence. On one occasion on an outbreak of swine fever 200 pigs were burned, and in one afternoon 50 were destroyed, three at once in a cell, only a faint odour of roast pork being perceptible on a hill to leeward of the chimney.

The working cost for the year ending 31st August, 1886, according to a statement furnished me by Mr. Newhouse, is as follows:—

	Burmantofts.			Armley Road.			Total.		
	£	s.	d.	£	s.	d.	£	s.	d.
Wages	572	1	2	590	7	0	1,162	8	2
Coal, oil, tallow, water, gas, etc.	77	0	9	103	19	6	181	0	3
Implements and repairs.....	67	8	4	159	19	7*	227	7	11
Rates, taxes and insurance	110	12	7	42	7	3	152	19	10
Lime (for mortar making).....	23	18	10	54	2	5	78	1	3
	851	1	8	950	15	9	1,801	17	5
Less mortar and iron sold	165	18	8	229	1	2	394	19	10
	685	3	0	721	14	7	1,406	17	7

* Exclusive of new-fire bars (Galleys' patent).

The capital cost has been, as already stated, £7,282 1s. 1d. at Burmantofts and £7,466 9s. 10d. at Armley Road. The loan is to be repaid by equal annual instalments of principal and interest in 60 years at $3\frac{1}{2}$ per cent., which amount to—

	£	s.	d.
Burmantofts	291	17	9
Armley Road	299	6	4
Total ..	591	4	1

for repayment of capital and interest.

The right to use the patent having been purchased for £2,000., £100 a year for each destructor, appears to be a fair proportion to allow for royalty. The total annual cost of the destructors is therefore—

	Burmantofts.			Armley Road.			Total.		
	£	s.	d.	£	s.	d.	£	s.	d.
Working cost.....	685	3	0	721	14	7	1,406	17	7
Repayment of capital.....	291	17	9	299	6	4	591	4	1
Royalty.....	100	0	0	100	0	0	200	0	0
	1,077	0	9	1,121	0	11	2,198	1	8

Beehive Destructor.—A furnace, called from its shape the “Beehive destructor,” the invention of Mr. Stafford, Assoc. M. Inst. C. E., borough engineer of Burnley, has been tried at Burnley, Bradford, Batley, Leicester and Richmond. It is circular, 6 ft. in diameter, with two fire-grates, one over the other, and a hearth covered with water below. The lower furnace is lighted up with coal and coke, and when it is well alight, the refuse to be burned is fed into the upper furnace. At Burnley it is still in use, burning shop and market refuse at night three times a week. About 3 cwt. of coal and coke is used to start with, and about 2 tons of shop refuse is burned in about 5 hours twice in the week, and $4\frac{1}{2}$ tons of shop and market refuse on Saturday night in about 12 hours. The refuse appeared to be light and easily burned when dry, and the cinder and ashes proved to be a very small proportion of the quantity burned. At other places similar furnaces have not been successful. At Bradford, one was abandoned after three months’ trial on account of the cost of the fuel required for working it. At Batley, where a trial was made with about 52 tons of ordinary ash-pit and privy refuse, 6 tons 18 cwt. of coal and coke were used, and the cost of burning was 2s. 9d. per ton, of which 1s. $2\frac{1}{2}$ d. per ton was for fuel. The chimney was 120 feet high, with a good draught, but the refuse was not thoroughly burned, and very little clinker was produced. The destructor was abandoned after a fortnight’s trial. At Leicester, five trials were made by Mr. Gordon, M. Inst. C. E., the borough engineer, in September and October, 1884, in which $100\frac{1}{2}$ tons of ordinary ash-pit refuse were burned with the aid of $7\frac{1}{4}$ tons of coal and coke in varying proportions. The ashes remaining weighed $56\frac{1}{2}$ tons, and the cost of burning, including coal, coke, and labour, was 2s. 2d. per ton of refuse. The chimney with which the destructor was connected was 160 feet high with a good draught. The furnace was considered a failure and abandoned. At Richmond (Surrey), two cells and a chimney 90 ft. high were erected in 1884. Complaints were at once made of smoke, effluvia, dust, and partially burned paper and other refuse matter escaping from the chimney and falling in the neighborhood. Grids were fixed in the flue and in the chimney, and baffle plates were fixed to throw the products of combustion downwards into running water in the chimney base. By these means the draught was checked, so that the quantity burned was reduced by nearly one-third, while the nuisance from the dust and effluvia was not abated, though the unconsumed particles of paper and refuse were smaller in size. Litigation ensued, and the use of the apparatus was stopped, not, however, before the original furnace had been re-built in a modified form, and a smoke-consuming chamber with two fire-grates in

which breeze was burned, had been added by Mr. Brooke, Assoc. M. Inst. C. E., the surveyor, with some promise of a better result.

At Batley, Leicester, and Richmond the bars of the upper fire-grates very quickly burned away.

Dust from Chimneys.—Although experience has shown that town refuse can be effectually burned in destructors and other furnaces without causing nuisance or offence at or about the works themselves, there are two points about which complaints have arisen. One is of a fine dust, and sometimes of charred paper, proceeding from the chimney and falling at some little distance off. The quantity of dust produced from the burning refuse appears to vary a good deal in different places, and the amount of it which is carried into the flue and up the chimney depends to a considerable extent upon the care with which the excessive draught in the high chimney is regulated by dampers. At one destructor about 2 cubic yards per cell per week was said to be removed from the dust chamber, but a more usual quantity is $\frac{1}{4}$ to $\frac{1}{2}$ cubic yard. A sample of flue dust from the Armley Road destructor was found on incineration by Mr. F. N. Sutton, to consist of 93·6 per cent. of mineral matter, and 6·2 of organic matter, the rest being moisture imbibed in transit. The mineral matter under the microscope appears to be ash and glassy slag, with many fragments of what seems to be filaments of glass, probably melted in the furnaces, and drawn out by the draught. It is not likely that in all flue-dust the organic matter is so completely burned as is this sample.

In the destructors more recently erected the main flue has been enlarged beneath the cells to form a chamber in which, the velocity being checked, the dust may fall. Instead of a flue 4 ft. wide, as in the earlier destructors, there is now a chamber 10 ft. wide and 8 ft. high, and with good effect. Sunk channels have been formed on each side of the bottom of the chamber to collect the dust, and low cross walls for the same purpose have been tried. The latter must be built of dry bricks in the middle to be pulled down when the flue requires cleaning, or preferably, there may be, as at Salford, a removable iron plate to close an opening wide enough for a wheelbarrow. Frequent removal of the dust is very necessary to prevent its being carried up the chimney. The large particles, such as charred paper, have been arrested by wirework screens or grids. At Derby, charred paper was stopped by two baffles or bridges in the flue a short distance apart, one at the bottom and the other at the top. The best preventatives, however, appear to be large dust chambers, proper regulation of the draught, and frequent removal of the dust.

Smell from Chimneys.—The other ground of complaint is an offensive smell from the chimney. In some instances it is true that the smell complained of did not proceed from the furnaces at all, but it cannot be denied that the smoke and vapour from furnaces burning town refuse have often an offensive smell which, under certain conditions of the atmosphere, can be recognised at some distance on the leeward side of the chimney.

Dr. Odling, in a report to the Bradford corporation, rightly, I think, attributes it to empyreumatic vapours given off when the refuse begins to burn before it reaches the hot fire, and is undergoing destructive distillation or frizzling. When, as in the Manchester and Birmingham furnaces, the fresh charge of damp refuse is thrown directly into the hot fire, this action must go on, and the arrangement in Fryer's destructor for feeding from the back of the furnace, while partially drying the refuse, affords a direct passage into the flue for vapours arising in the cooler part of the furnace.

The products of combustion must of course vary with the nature of the material burned, but a good deal more depends upon the rate at which it is burned, and the care and regularity with which the furnaces are fed and clinkered. Smoke and imperfect combustion, follow any attempt to overload the furnaces, and this is especially the case when refuse is unusually wet. Where there are many cells or furnaces, by careful and systematic firing and clinkering the gases from the recently charged and cooler fires may be made to mingle in the dust chamber or flue with those from the hotter fires, and a temperature may be obtained high enough to destroy offensive vapours that escape from the furnaces. The care with which firing and clinkering is regulated at Manchester and Leeds has been mentioned, and it might be followed with advantage in other places.

The Fume Cremator.—To effect the combustion of offensive vapours it has been suggested that the gases from the furnaces should be passed through or over another fire. The destruction of smell by passing the vapours from the excreta dryers over the fires of the Birmingham refuse-furnaces has been mentioned, and it is still more strikingly exemplified at the Rochdale works, where there is a special furnace for the purpose, through which the vapours from the drying cylinders are forced by a blower after having been passed through condensers. The furnace devised by Mr. Charles Jones in connection with the Ealing destructor has been described. As patented, the fume cremator differs from that erected at Ealing in being circular in cross section, and one of this form was added to the Blackburn destructor. The fire-grate is broken up into six strips 9 in. wide and 2 ft. long, separated by 9 in. of hearth, and the actual grate area is only 9 sq. ft. compared with 20 sq. ft. at Ealing for the same number of cells. The fire occupies a width of 2 ft. at the bottom of a cylindrical furnace 3 ft. 6 in. in diameter, instead of a width of 4 ft. in a furnace 3 ft. high. The cremator is badly placed, and there are unfortunate throttlings of the draught. The effect of the cremator was, it is stated, to reduce the draught by one-fifth, and the quantity of refuse burned from 108 tons to 77 tons per week, while the consumption of coke was 8 tons per week, and the cost of working was increased at the rate of £200 a year, which included an attendant at 30s. a week, and the coke at 5s. 10d. per ton. Its use has been discontinued on account of the expense of working.

At Bournemouth the cylindrical form has been repeated, but there is no throttling of the draught. It is proposed to burn cinders screened from the refuse instead of coke breeze in the cremator.

A separate furnace in which the vapours are burned is likewise a feature in the Nelson destroyer, and appears to effectually answer the purpose of consuming the smoke and vapours.

Washing the gases by water spray has been proposed as a means of depriving them both of the fine dust and the offensive vapours. It would, by lowering the temperature, seriously diminish the draught unless the latter were maintained by other means. A closed ash-pit, with a forced draught by means of a blower or a fan, as in use at Glasgow, or a steam jet or an exhaust fan in connection with the chimney might perhaps be applied to maintain a draught sufficient for proper combustion. In the destructors at present in work there is generally sufficient surplus heating power to provide a forced draught, but any power applied to that purpose would, of course, be no longer available for other more remunerative work.

Experiments and Observations.—Temperatures.—It appeared to be desirable to get further insight into the process of combustion in furnaces burning town refuse, and I am indebted to Mr. A. E. Fletcher, the Chief Inspector under the Alkali Acts, for the valuable help of his assistant, Mr. F. N. Sutton, in making experiments for that purpose. Observations were made on the temperatures and composition of the products of combustion, and the speed at which they pass off, at White Chapel, Ealing, and Bradford. The temperatures were taken with Siemen's water pyrometer, those of the different cells being taken in the flue leading downwards to the dust chamber, as giving a fairer result than any position within the cell itself, where high temperatures are to be expected at points when combustion is active. As might be expected they were found to vary a good deal, according to the condition of the fires. At the White Chapel destructor the temperatures on July 6th, 1887, ranged from 180° to 1,000° Fahr., the average of the eight cells being 490°. The highest temperature observed was about 20 minutes after the fire had been clinkered, and the lowest when a charge, largely composed of damp vegetable refuse, had recently been drawn down onto the fire. A dead fire ready to be clinkered gave off gases at 290°–300°. Some cold air was admitted into the flue while the pyrometer heater was in it, so that something under the usual temperature may have been recorded. Any error from this source was avoided in subsequent experiments. Three trials of the temperature in the main flue between the destructor and the chimney shaft, at about 40 feet from the former, gave 410°, 540°, and 410° at intervals of about 20 minutes. The material being burned, owing to the season of the year, contained a very large portion of green vegetable refuse, and but little cinders and ashes, and was probably as bad a sample

for burning as ever comes to the destructor. The feeding and clinkering of the furnaces was being carried on as usual, one furnace being clinkered every 10 minutes, until all were clinkered, and there being then an interval of half an hour, when the process was repeated; the furnaces being taken, not in rotation, but in the order in which they needed clinkering. It may, perhaps, be doubted if the lower temperatures at which the burnt gases escaped from the cells are sufficient for the perfect destruction of contagia and virus, but the mean temperature reached in the dust chamber, where gases from all the cells mingle, would be enough to deprive the small particles passing off of any infectious properties they might possess.

At the Ealing destructor, burning the mixture of sewage, sludge and refuse already described, and house-refuse, in about equal proportions, the temperatures observed in the flues leading from three cells were 855° , 520° , and 520° . The fourth flue could not be conveniently got at, but, judging from the fire, the temperature was probably about the same as in the second and third. The temperature of the gases after leaving the destructor and before entering the cremator, was, when the fires were all dead and requiring clinkering, 445° ; at other times temperatures of 565° and 625° were observed; and with three fires in good condition, and the fourth moderately good, the temperature was 700° .

No great increase in the temperature of the gases, after passing through the fume cremator, was observed on this occasion, and the heat in the cremator, taken at about eight inches above the coke fire, did not exceed 700° . At a later visit, when the second analysis given in the tables below was taken, there was a hotter fire in the cremator, and the gases passing from the destructor at 675° had a temperature of 880° on leaving the cremator, the heat three inches above the coke fire in the latter being 970° . The mixture of sludge and refuse was then being burned without any other refuse.

At Bradford, the temperatures of the gases from the six cells of one block of the destructor, ranged from 270° to 730° , the mean of the whole being 480° . The observations were all made soon after the fires had been clinkered and fed, the lowest result being from a cell which was fed while the heater was in the flue, with wet midden and and green vegetable refuse. Observations taken in the main flue leading from the six cells to the chimney an hour before and three hours after gave a temperature of 415° .

At Armley Road, Leeds, observations were made in the main flue between the destructor and the boiler, to compare the readings of the Siemens' water pyrometer with those of a pyrometer by Casartelli, composed of tubes of different metals. The Siemens' instrument gave temperatures of 580° and 650° , when the Casartelli pyrometer indicated 570° and 670° not far off, a sufficiently close agreement. Pyrometers are now fitted in the main flues of both the Leeds destructors, and registers are kept of their readings, which cannot fail to promote careful clinkering and feeding. The average heat for the day at the Armley destructor appears from the register to be from 530° to 540° , ranging from 350° or 400° on Monday mornings (the fires having been banked on Sunday) to 650° or 670° in the afternoons. These good results are, no doubt, due as much to the regularity with which the cells of the destructor are fed and clinkered as to the venetian fire-bars with which the furnaces are fitted.

The foregoing observations appear to show that the temperature generally reached in refuse furnaces has been exaggerated.

Volume of air entering furnaces.—To ascertain the volume of the gases passing off, and thence to deduce the proportion of the air entering the furnaces to the refuse burned, it was necessary to measure the speed of the gases in the main flue or chimney. This was done by Mr. Fletcher's anemometer, and also by a ready method previously adopted by me, whereby the time taken by a puff of fine dust in passing up the chimney of known height was measured. The results obtained by the two methods agreed fairly well, giving the velocities of the hot gases as from 10 to 15 feet per second. The speed and temperature of the hot gases being ascertained, and the area of the flue being known, after allowing for the aqueous vapour passing off, the volume of air entering the furnaces could be deduced with tolerable accuracy. The quantity of refuse being burned could only be estimated, by taking the daily average quantity, and this renders the results obtained only approximately accurate. Without entering into details it is sufficient to

state that the air entering the furnaces appeared to be about $8\frac{1}{2}$ tons to a ton of refuse burned at the Armley Road destructor, Leeds, about $9\frac{1}{4}$ tons of air to a ton of refuse at White Chapel, and about 13 tons of air to a ton of refuse at Bradford.

It is instructive to compare these results with the proportion of air to fuel of a better quality.

Proportion of moisture in refuse.—For the complete conversion of a ton of carbon into carbonic acid, the oxygen of 12·2 tons of air is required. In practice at least one-half more is necessary, and in ordinary boiler-furnaces nearly double this quantity of air is used for perfect combustion of coal. The air entering a furnace burning town refuse appears from the above experiments to be less than, or not much to exceed, the theoretical quantity required to convert the refuse into carbonic acid, supposing it to be all carbon; or about one-third to one-half what is required for the complete combustion of coal containing about 80 per cent. of carbon in an ordinary boiler furnace. But we know that the refuse contains comparatively little combustible matter. Instead of leaving 4 to 8 per cent. of cinder and ashes as coal does, it leaves 25 to 33 per cent., and it contains besides a large proportion of moisture. To get a definite idea of what the proportion of the latter is, some experiments have been made for me by Mr. Cox, Mr. Newhouse, and Mr. La Riviere. Vessels containing samples of refuse were placed in the main flue or chimney base, and thoroughly dried with proper precautions, and the loss of weight was ascertained. The trials were all made in October 1887, and results are shown in following table:—

Description of Refuse.	Loss of Water in Drying.	—
Bradford.—Average ash-pit refuse, neither very wet nor very dry.	47 per cent.	Mean of 10 trials with 324 lbs. of refuse. Material charred.
Leeds.—Dry ashes, privy-midden refuse, vegetable and animal matter, as taken from the platform.	39 “	Mean of two trials with 124½ lbs. of refuse.
Leeds.—Dry ash-pit refuse.	31 “	Trial on 60 lbs.
Leeds.—Privy-midden refuse.	33 “	Trial on 60 lbs.
White Chapel.—Average refuse.	29½ “	Mean of 6 trials on 101 lbs. of refuse.
Vegetable refuse.—Bradford.	51 “	Trial on 17½ lbs.
Fish refuse.—Bradford.	82 “	Trial on 33 lbs.
Garbage.—Leeds.	93 “	Trial on 8 lbs.

The ordinary ash-pit refuse of Bradford, which is found to contain 47 per cent. of water, leaves 33 per cent. of clinker and ashes, so that not more than 20 per cent. of the whole can be actually burned; and the 13 tons of air to a ton of refuse is 65 tons of air to a ton of fuel burned.

Similarly, at Leeds, the 39 per cent. of water and 33 per cent. of cinders and ashes leave not more than 28 per cent. combustible, and the proportion of air to the fuel burned is more than 30 tons to a ton. At White Chapel, when the air was measured in July, the moisture in the refuse was far greater than in October, and the proportion of air to refuse was probably between the two just given.

Analyses of escaping gases.—The results of analyses of gases taken from the main flue are given in the tables below. Two analyses of gases from the Leeds destructors, which are given in a report by Mr T. Fairley, the borough analyst, are added to those made by Mr. F. N. Sutton. In a second table the oxygen and nitrogen are stated as common air and nitrogen, that being the condition in which they pass off.

ANALYSES OF GASES FROM DESTRUCTOR FURNACES.

—	White Chapel.	Ealing (1).	Ealing (2).	Bradford (1).	Bradford (2).	Leeds, Armley.	Leeds, Burman-tofts.
Carbonic oxide.....	1'00	0'70	0'15	0'00	0'00	0'00	0'00
Carbonic acid.....	2'54	1'00	2'20	1'60	2'40	2'32	1'24
Oxygen.....	17'55	18'20	18'20	18'70	18'00	17'42	18'11
Nitrogen.....	78'91	80'10	79'45	79'70	79'60	80'26	80'65
Volumes.....	100'00	100'00	100'00	100'00	100'00	100'00	100'00

THE SAME ANALYSES OTHERWISE STATED.

—	White Chapel.	Ealing (1).	Ealing (2).	Bradford (1).	Bradford (2).	Leeds Armley.	Leeds, Burman-tofts.
Carbonic oxide.....	1'00	0'70	0'15	0'00	0'00	0'00	0'00
Carbonic acid.....	2'54	1'00	2'20	1'60	2'40	2'32	1'24
Air.....	83'57	86'66	86'66	89'05	85'71	82'95	86'24
Nitrogen.....	12'89	11'64	10'99	9'35	11'89	14'73	12'52
Volumes.....	100'00	100'00	100'00	100'00	100'00	100'00	100'00

It will be observed that in the first table the volume of nitrogen is nearly the same in all the analyses, and represents the 79 per cent. of nitrogen in the air that passes into the furnace. The 21 per cent. of oxygen in the air entering the furnace is represented by the unconsumed oxygen, by the per-centage of carbonic acid (which is equal in volume to the oxygen combined in it), and where there is carbonic oxide by half the volume of that gas. A small proportion of the oxygen may also combine with any hydrogen there may be in the fuel, and pass off as aqueous vapour.

III. WATER SUPPLIES IN THEIR SANITARY RELATIONS.

At a time when so many municipalities are engaged in discussing the questions, on the one hand of the pollution of wells and other common sources of supply, and on the other the possibility of obtaining some public supply of assured purity, it may be of value to summarise some of the facts which have an everyday bearing on this most important question of municipal sanitation. The question of how to get enough of water is not primarily a sanitary but an engineering one; but inasmuch as the dangers of impurities from percolation are increased, the ordinary volume of water being lessened, we see that the two are intimately associated with each other.

Starting from the point that all water supplies are due to precipitation of water vapour, we perceive that their impurities are those which water receives while washing out the air in its descent, and whatever afterwards it may take up from the roofs of houses, the surface of the soil, etc. Water being a general solvent, either *per se* or by the carbonic acid, nitric acid, etc., which it takes up, we see that its impurities as compared with distilled water are most numerous; but with regard to those which have a sanitary

bearing, those from the air may be said to be only the micro-organisms which may, so to speak, be washed out, or which become attached to water-drops during a rain storm, and which become in towns a matter of serious importance. This fact, first fully proved by Miquel, of Montsouris Observatory, by daily observations of the number of microbes in the air of Paris, has been most recently neatly illustrated by Percy Frankland in experiments published in the Transactions of the Royal Society of London, 1887. Thus, he found by the *gelatine process*, as elaborated by him, the following numbers of micro-organisms in air the samples being examined on two different days :

July 22nd, 1886.—Wind S.W., strong, variable in direction, 23° .9 C temp. Four collections of air : average of colonies =114.

Average of colonies, taking 20, c. c. of the solution=71 colonies.

Hence 119 litres =1,360 colonies.

10 litres of aspirated air =114.

Same day, with much dust :

10 litres =169 colonies.

July 26th.—Wind W. by S.W., copious rain previous day and night, but road and pavement dry at time : 20° C temp.

119 litres of air gave 354 colonies.

10 “ “ 29 “

Afternoon of same day : heavy shower since morning :

119 litres of air gave 146 colonies.

10 “ “ 12 “

Hence we conclude that to the degree that the air was made purer, the water falling upon the soil was rendered impure. But as Duclaux and Koch have observed, the air is purity itself as compared with the soil and soil matters to which particles can adhere (although, doubtless, as has been proved by Miquel in his tables of the rise and fall of zymotic diseases in Paris, rise for a number of days after a rain, to fall subsequently again with rain, the air is especially the primary vehicle of distribution for the microbes of disease from the persons of men and animals, the rooms of houses, the wards of hospitals, etc.) ; and hence it is that we must naturally attach the greatest importance to the conditions of the surface of the soil, and of the houses upon which rain falls, as also to the materials which reach ground water from manure-heaps, privy-pits, sewers, etc.

The relations of the soil, as regards its physical characters, are perhaps a factor of importance equal with that of the impurities which fall upon it, or are deposited on it ; since upon the character of soils, whether pervious or impervious, must depend in large measure the dangers of contamination of the subterranean water-supply. Pettenkofer has recently discussed this point in a paper “ On the influence of the soil in the Development and Propagation of Epidemics,” and I cannot do better than quote his remarks thereon :

Two primordial conditions regulate the rapidity with which rain passes through the layers of the soil, and the power of absorption of the soil. These are—the total volume of space and of pores contained in a given piece of ground ; also, the individual dimensions of each pore. The volume of the pores does not vary much in different soils, and may be considered to occupy the third part of the whole. The dimensions of each pore vary considerably in different soils. In soil which contains large pores the water penetrates rapidly ; a compact soil, in which the pores are very fine, is essentially hygrometric. Adjacent layers of earth of different natures absorb water in different proportions ; the power of absorption which any given soil exercises can only be determined by examining this soil at different depths. Hofmann found that a piece of ground where dust heaps had been thrown at Leipzig, contained 374 kilogrammes of water three metres below the surface, while some adjoining soil contained only 147 kilogrammes nine metres below the surface ; the total volume of water contained in the piece of ground was 1,122 kilogrammes, in the virgin soil the total volume was 1,258 kilogrammes. Hofmann further calculated that if the soil was completely parched, a rainfall of 1.20 metres would be required to restore the normal degree of humidity. This does not take into account the loss of humidity through evaporation and waste which amounts to fifty per cent. The level of the subterranean layer may be quite uninfluenced by the heaviest rainfalls, if it is low down and separate from the surface by layers, which retain the heaviest rainfalls without letting a drop pass through. The maximum rainfall generally corresponds to the highest level of the subterranean layer, but

the lowest level of the layer is observed before the minimum rainfall. With regard to permeable and hygro-metric properties, Hofmann divides soil into three zones; the superficial or evaporating soil passes through all the intermediate stages of complete dryness to complete saturation.

It forms a reservoir which may collect the rainfall of a whole year; it is a receptacle for all pollutions, microbes, germs, or ferments deposited on the surface of the soil, which cannot penetrate to the lower layers, excepting through the action of excessive humidity. The hygienic importance of this zone is considerable.

The intermediary zone is in a constant state of humidity, excepting when it receives the surplus of the superficial zone. This surplus passes quickly through to the subterranean layer. The intermediary zone collects a quantity of water which is equivalent to the rainfall of several years. The superficial zone prevents evaporation from the intermediary zone.

The third zone, in compact soil, is only a few centimètres deep; in porous soil it is from one to two mètres deep. The subterranean water acts upon this zone by capillary attraction. It forms a permanent layer, or a level which gradually descends, when the intermediary zone supplies no more water, and rises, when this zone yields an excessive quantity of water.

When this level descends it generally indicates that water has ceased to penetrate from the surface, and consequently that the subterranean layer receives no more pollution from the soil. The infection of the subterranean layer is a concomitant condition of the infection of the soil. This is effected by a process which will now be described.

Germs, micro-organisms, organic matter, or ferments are deposited on the surface of the soil; if these are not dispersed by the atmospheric currents, it appears that only the action of water can cause them to penetrate below the soil. Porous soil is rapidly contaminated, but the contamination is less thorough than in compact soil, where the water mixes less quickly with soluble substances passing through it, and where these substances penetrate slowly through each layer, and form localized areas of contaminated zones, which alternate with zones which are intact.

Hofmann observed that the average rate of rapidity with which matter, deposited on the surface of some virgin soil, at Leipzig, penetrated in a day was 6·2 millimètres. This would represent a monthly rate of progression of 186 millimètres, and an annual rate of 2·26 mètres. This calculation does not allow for loss of humidity through evaporation and waste. The elements of an infectious fluid of a vigorous and active nature penetrate the soil rather more rapidly, but the hourly rate of progression does not exceed a fraction of a millimètre. This slow rate of progression is conducive to telluric infection; it allows sufficient time for the production of spores on the surface of soil in which the superficial layer preserves a relatively high temperature. Experiments made by Soyka prove that spores are more rapidly produced in soil than in fluids.

This scientist mixed given quantities of broth, peptonised in the proportion of 1 per cent., in which large proportions of bacteria, free from spores, were placed with some pure silicated sand in which each grain was two millimètres in diameter, and in which the volume of space and of pores occupied about two-fifths of the whole mass. The spores were more rapidly produced in this mixture than in a fluid. In another experiment this artificial soil contained disengaged spores at the end of four days, whilst in the liquid broth there were not any spores at the end of six days. In another experiment the soil contained spores ten hours after the beginning of the experiment, whilst in a broth cultivation the spores only appeared after forty-eight hours. In order to obtain an abundant production of spores the liquid added to the sand should occupy a quarter of the volume of the disengaged spores; if the water exceeds this proportion the spores will develop more rapidly, but in lesser quantities.

The same results may be obtained with the *bacillus subtilis*.

The results of these experiments are explained by the fact that the liquid mixed with the soil is widely dispersed in the capillary regions of the rocky portion, and is thus more exposed to the influence of oxygen, which is an aliment for aerobes; capillary attraction further maintains the liquid in a thin layer placed in contact with the elements of the rock, but a certain immobility in the liquid mass, which contains quantities of bacteria, is thus induced. This immobility impoverishes the cultivation, and, according to a biological law, the spores appear more quickly on this account. Excessive humidity, which dilutes infectious matters, may be as fatal to microbes as complete dryness of the soil.

Manifestly, therefore, the condition of the soil, and especially the surface soil, as a culture medium, is of enormous importance in relation to the purity of subterranean water supplies. While it is true, from Hofmann's experiments, that the rate of progression of polluted matter through soil is comparatively slow; yet an annual advance of about 2½ yards means contamination to a very considerable extent in a few years, if the source of contamination remains, while the purifying process is in defect of the demands upon it. The statement that porous soil is more readily, but less thoroughly infected, is quite in keeping with what we would expect; and while this is doubtless due to its greater porosity, it may be that this fact by allowing the presence of a larger amount of oxygen will act ultimately in a beneficial manner in certain instances by exhausting by fermentation the dangerous products in a soil. The fact that compact soils do become thoroughly contaminated, has an important bearing upon the question of the dangerous quality of waters drawn from different zones; since while it is true that the presence of oxygen in these deeper soils is the necessary requisite to the development of microbes, yet the fact that spores may pass onward with waters must account for the fact that waters from contaminated soils apparently become dangerous after they have filtered into wells, and there been enabled to come in contact with oxygen, practically absent in the deeper subsoils. As the decomposition of organic matter in soil,

whether animal or vegetable, depends upon the same conditions, I quote here some remarks from a previous report, as to the causes promoting malaria in the Grand River region :

The soils of the river valley, having always a certain amount of vegetable organic materials present in them, are first saturated with moisture. By this is caused a movement of the water towards the lower levels, at first we must suppose as sub-soil water at, or very near, the surface. Now, according to all experience, either with ordinary cultivated plants or the lower forms of vegetable life, this condition is most unfavourable to their free growth and development. But with drier weather the sub-soil water is lowered, and the interstices of the soil previously occupied with water are occupied with air, the upper looser portion having most, while every inch in depth will have more moisture, and, consequently, less air. Experience further shows that if this moisture is considerable the higher forms of vegetable life develop but poorly, while the coarse grasses and sub-aquatic plants take their place. But the moist soils are further favourable for the growth of cryptogamic vegetation of every kind. The conditions are much moisture and smaller amounts of air in the soil. But as the drying out of the soil proceeds, with the gradual lowering of the sub-soil water, the area in which sub-soil air is present is increased until we finally get a comparatively dry upper layer of well aerated soil, with layers as we descend, more moist and containing less air. Hence we have as results a soil which has passed through the stages which all experience shows to be most favourable for the development of bacterial life, viz.: sufficient moisture, not abundant but sufficient air, with, of course, sufficient heat being present. Without the air, organic decomposition does not take place in large amount; but yet, as Dr. Angus Smith has remarked, in all probability nitrates yield up, in the presence of heat and moisture, and in great degree the absence of air, their oxygen in the decomposition or putrefaction of organic substances. On the other hand, the facts stated above concerning the vegetable forms which grow in soil with different amounts of moisture, as well as facts which have been noted by various biologists in the development of bacterial forms, and others very recently published in some experiments by Dr. Angus Smith on sewage decomposition, go to show that abundance of air will not only soon exhaust the conditions favourable for the free development of bacterial life, but will actually prevent, at least for a time, organic decomposition.

On this particular point we may glean some information from the discussions on the development of micro-organisms. Thus, as stated by Magnin, Pasteur affirms that there are two classes of these bacterial organisms, the *aerobies*, or those living in contact with air and needing oxygen; and the *anaerobies* which not only have no need of oxygen, but are destroyed by it. Thus in putrefaction, according to Pasteur, there are the forms, *monas crepusculum* and *bacterium termo* which absorb all the oxygen dissolved in the liquid, and then come to the surface where they form a thick veil, after this other *vibrionicus* appear developed in a liquid almost entirely free from oxygen, by obtaining this gas from the fermentable matters contained in the liquid.

Bringing these opinions, which are given from various standpoints, to bear on the question before us the following seems to me quite apparent, viz.: that we have four stages in the history of the falling sub-soil water: (1) One, where the small amount of air in the upper soil, through the large amount of water present, prevents, to any great extent, decomposition of organic matter, and hence, proportionately, the growth of plants of any kind. This prevention of growth is, doubtless, aided from the fact that the evaporation from the surface of the soil keeps it at too low a temperature for the development of bacterial life, since Cohn has shown that at and below 32° F. bacteria cease to develop, and that temperatures from 77° to 104° F. are the most favourable for them. (2) The second stage is that in which air and moisture are both present in the soil in moderate amounts, and in which, with a warm temperature, decomposition of organic matter goes on rapidly, and bacteria under various forms, as micrococci and bacilli (according to Miquel) are present in large amounts. (3) There is the stage when the upper soils are dried out on the surface. (4) We have a final stage of drying out when the upper soil may contain, as remarked by Parkes, from two to ten times its own volume of air, and be parched, and contain almost no moisture. It will then be evident that while no one of these ever wholly exists over an extended area, yet there still are times when some one of them is the prevailing condition; and, moreover, for reasons already indicated, such must have very definite influences on the amount of bacterial life present in the soil. Now, taking these conditions in order, it may be affirmed with much certainty that malaria cannot exist largely when the soil presents the conditions in the fourth stage; but this is rare; The second stage is one in which it may be said that bacterial life develops with greatest readiness, and during which it may be affirmed that *bacillus malarie* is abundantly produced.

Regarding stage four, both experiment and analogy lead us to infer that as the conditions which create the disease, seen in stage three, develop into stage four, the development of germs is in large degree retarded. For the full explanation of this reference can be made to the subjoined printed extracts from Miquel.

Another point already hinted at in its bearing on the question, must be referred to here. It has been already stated that the sun's rays increase the soil temperature many degrees above that of the air above it during the day. This super-heated layer of soil will not be thick; but the fact in this connection must be noted, that it increases throughout the summer. In temperate climates the heat passes in summer some four feet into the soil during the day, and recedes at night. In all probability the transmission of heat is due principally to air currents, since it must be perfectly plain that the heated air of the soil will rise rapidly out of it, in proportion as it is heated, above the temperature of the surrounding air. Some remarkable experiments have recently been made public by Prof. Tyndall, which prove in the clearest manner that in addition to the facts above stated, and which are well known, the declining sun gives an opportunity for a completely different set of phenomena to take place. Speaking of the radiation of heat, he remarks that the earth, as compared with space, is a comparatively hot body, and that were it not for the apparently trivial amount of invisible vapour in the air the earth would soon be reduced to the frigidity of death.

These experiments not only point to the fact that radiation produces most rapid cooling of the earth, but also that in the same degree the air in the soil, as well as over it, must greatly contract with the sudden fall of temperature. Hence we may say that not only does soil air largely pass out of the soil during the day, but also that a considerable amount of fresh air returns to the soil at night. In other words, ground

air bearing the gases of decomposition, and possibly invisible organisms, passes up into the outer atmosphere every warm day, and has its place largely taken by fresh external air with abundance of oxygen for continuing decomposition in the soil and the development of bacterial life.

Of necessity the deeper that air is in the soil the less will it be subject to change of temperature, and hence have its constituents change less, and will, therefore, always contain more carbonic acid and less oxygen; and thus the supposition that because the deeper air contains, on experiment, more carbonic acid, that therefore putrefaction and bacterial life are more intense, is wholly incorrect. But while we have thus explained how oxygen in sufficient amounts for the development of bacterial life in the soil is supplied, we have, in large measure, disposed of the theory which affirms that stagnant ground water is the chief factor in malaria. That stagnant ground water near the surface is coincident with malarial diseases does not prove that these stand in causal relation to each other, as Col. Waring and other sanitarians have suggested; but all that can be fairly inferred from the two facts is that water is always so near the surface that the upper germ-producing layer is, by capillary attraction, always sufficiently supplied with water to favour the development of such forms.

Bearing directly on this same subject from the engineer's standpoint, I quote some statements by Mr. Baldwin Latham, C.E., before the Conference of Medical Officers of Health, England, 1886, on "The Influence of Ground-water on Health." He said:

With rain in autumn, a mild winter, neither very tepid nor unseasonably cold, and rain in spring and summer, the year is likely to prove healthy; but if the winter is dry, and the spring showery, the summer would necessarily be of a fertile character. If, at the rising of the Dog-star, rains and wintry storms supervene, there is reason to hope that disease will cease, and the autumn will be healthy. It was curious that a dry winter was often the precursor of disease, not at that time, but in the following autumn. As a rule a short supply of rain in December had a most marked influence upon the stores of underground water, and a deficiency of rain in this month had probably a greater effect in influencing the future health of any particular district than it had in any other month of the year. As a type of a healthy season the present year was an example. It might be interesting to note that some years ago Dr. Laycock published an interesting account showing the incidence of disease in York, from which it appeared that this city was always susceptible to violent outbreaks of disease traceable to local sanitary circumstances combined with peculiar climatological conditions.

The results of his prolonged investigations on the subject of ground water in this country and elsewhere, clearly showed that there was generally a direct parallelism between the conditions of health and the volume of ground water. The years in which there had been a large quantity of ground water present had invariably been the healthiest years, while those in which there had been a small quantity had invariably been the most unhealthy periods. As a rule the lowness of the ground water indicated the future health, and not the state of health at the particular time of lowness, that was the unhealthy period, as a rule, followed the period of low water—the degree of lowness indicating the intensity of future disease, especially fever. In some cases an unhealthy period ran concurrently with the period of low water, but in all these cases there was clear evidence that percolation had recommenced before the unhealthy period took place. These results were entirely confirmed by observations which were carried on in Paris between the years 1868 and 1883, and which had been collated and published by M. Durand Claye, Chief Engineer of the Municipality of Paris, with the object of putting all the facts and circumstances in connection with the outbreaks of fever in Paris at the disposal of those who might choose to investigate the subject. With regard, also, to the experience in this country as to subsoil water, the lowering of the subsoil water by artificial means would produce a tendency to the development and dissemination of typhoid fever. The effect of drainage works during their construction in lowering the subsoil water where precautions had not been taken to speedily and permanently get the water back to its proper level had been, in many instances, the cause of outbreaks of typhoid fever, but which at the time had been attributed to the construction of the sewer works and to sewer-gas, even in cases where no connections had, at the time of the outbreak, been made with the sewers.

Speaking in regard to observations he had been carrying on at Croydon, he referred to the condition of the ground water, and the effect of the rainfall upon the death-rate, and he went on to show that by the returns of the Registrar-General, which showed the deaths in every quarter of the year, the most unhealthy periods were invariably those quarters immediately following the periods of low water. With regard to deaths from fever, the years in which there has been the lowest subsoil water generally in the country are shown to be the most unhealthy; as, for instance, the two years 1864, 1865. The year 1884 was an exceptional year in Croydon, and it was by means of such exceptional periods that they were able to draw some conclusions as to the probable influence of ground water upon health. It was clear to his mind, after the most careful consideration of the subject, that ground water itself had no influence, either for good or evil, upon health, but that the lowness or highness of the water in the ground were the index of conditions which greatly influenced the health of all communities. There were periods of abundance of water, and periods of low water with both healthy and unhealthy conditions. Ground water had been shown by Professor Pettenkofer to be chemically more impure in periods of high water, when the conditions were favourable to health, than when there was a low state of the ground water, and a condition unfavourable to health. The records also showed that they had periods when rain had started into existence malignant diseases, while, on the other hand, there were similar heavy rainfalls accompanied by a high state of public health, as in the present year. The records clearly pointed out that it was not one circumstance alone which produced disease, but that there were at least three factors necessary for the production and distribution of disease, especially typhoid fever, viz.:—(1) The elements which produce disease, such as a polluted state of the ground; (2) the conditions which are necessary for the development of disease, such as a period of dryness of the ground in those regions which water usually occupies, combined with a comparatively high degree of temperature; and (3) conditions which will lead to the spread of the disease, such as the probable influence of a storm or rain in driving impurities out of the ground into our water supplies, or through the instrumentality of ground air passing into our habitations, and its reception by a population which is in a condition to receive such germs of disease. If any one of these conditions was absent, diseases like typhoid would not occur.

Fifty years of percolation observations at Nash Mills showed percolation to be almost coincident with zymotic diseases. Mr. Latham then dealt with the influence of light and the influence of temperature, and pointed out that cold was not essential to the promotion of disease, especially in children under five years of age. When we came to isolate the deaths in particular months, and compare them with the periods of low water, it often happened that extreme low water in winter corresponded with periods of great cold, and low water in summer also corresponded with periods of great heat, and it is only at such times when they were able to discount these influences by comparing them with periods when they had a normal state of things with reference to temperature, and abnormal in regard to ground water, that the influences measured by the ground water were brought into prominent relief. Pettenkofer, in his researches, had not ignored the conditions which affected epidemic disease, for example the conditions of wealth as contrasted with poverty. It was clearly shown that poverty had a marked influence in the dissemination of disease, and that epidemics fell more lightly upon the wealthy classes than upon those who were not so happily circumstanced. It should, however, be observed that the social position of different classes of society did not affect the periodicity of the outbreaks of disease, and occasionally typhoid fever attacked the wealthy classes more violently than those less favourably circumstanced, as was the case in Croydon in 1875. A very marked circumstance in connection with ground water, and the period of percolation, was shown in the case of deaths of children under five years of age. While there might have been mistakes with reference to the causes from which a child died, very little error occurred with regard to its age. He was of opinion that the proper way of estimating the sanitary state of any period in any district, was by taking the number of children under five years of age, and calculating the deaths by the number living at these ages. The most healthy periods were those in which there was the most ground water, and the least healthy those in which there was the least ground water in any year. These results corroborated the strong relation which existed between the highness or lowness of water in the ground in regard to zymotic diseases. It also showed that there were influences at work, which could be measured by the quantity of water in the ground, which were destructive to young life, and which might be guarded against, as these influences indicated themselves many months before they began to affect the population, therefore, "to be forewarned is to be forearmed." The fluctuation of the water line was an essential condition in the development of disease, especially typhoid fever and cholera. They had the record in connection with the city of York, in which it was clearly shown by Dr. Laycock, in his report on York, published in the first volume of the Health of Towns Commission, that previously to the construction of the lock at Naturn below the city, the tide used to flow up above York, and there were considerable variations in the level of the waters from time to time, but, after the construction of the lock in question, the health of York materially improved. The health of districts such as the Wandle Valley was proverbial. In the latter district there were a large number of mills in a comparatively short length, holding up the water to a uniform level. With such examples for their guidance, it was clear that sewers might be of great advantage in maintaining uniformity in the water level. On the other hand, leaky sewers were liable not only to pollute the ground, but to cause considerably greater variation in the levels of underground water than would otherwise occur in various parts of the district. Good land drainage had a tendency to produce uniformity of water level, but this should rarely be attempted to be secured through the instrumentality of sewers carrying polluted matters. The influences which were observed clearly pointed out how important it was to guard districts against pollution of the earth. How little regard, however, had been paid to this point, for it was only within the last ten years that the importance of making sewers as watertight as possible had received serious consideration, and still, in many parts of the country, sewers were being constructed without any regard to watertightness and their other influences on ground water.

To make in some degree complete these extracts on the bacteriology of soil, I quote from Koch's statements regarding the micro-organisms in earth. He says :

Some experiments I made on the organisms contained in the earth, although few in number, still afforded fairly constant results, and permitted the general conclusion that the upper layers of the soil are particularly rich in spores of micro-organisms (the great majority being bacilli). In perfectly fresh earth micrococci are usually found, but almost always in small numbers. In testing very impure places, such as soils impregnated with manure, the number of micrococci exceeds that of the bacilli, and moulds were also present, but this is of course simply a local peculiarity. Bacilli, on the other hand, occur constantly, and always in large numbers, in the superficial layers of the ground round dwelling houses, and where gardening and agriculture is carried on. I have found them in the earth of the garden of the Veterinary School in Berlin in as large numbers as in the earth of a disused cemetery, and in earth taken from gardens and ploughed fields at a long distance from any thickly populated parts. If the portions of earth are first dried for a few weeks micrococci do not appear in the cultures, while the bacilli are as numerous as before. Since it has been known for some time that micrococci do not form spores, and consequently can survive the dried condition but a very short time, it is obvious that while the micrococci are killed by the drying, the bacilli must be present in the earth in the form of spores. This view is confirmed by the fact that the germs of the bacilli in the earth can withstand degrees of heat which are fatal to everything except spores. This we have found to be the case in experiments on disinfection. Since only spores and very rarely bacilli are found in the earth, it seems to me very probable that these spores are not developed at the spot where they are found, but are brought to the soil in manure and putrefying material; it is also very possible that they may be swept off by a current of air from the place where they are developed, carried a long way, and deposited on the earth, and hence become mixed up in its upper layers. The chief bacilli found in earth are hay bacilli and the bacilli which form the root-like colonies already described; but besides these there are often a few more, usually 6 or 8, very well marked species of bacilli.

I observed one very striking fact, which, however, I do not assert to be invariably true as it is only based on a few observations. It consists in the steady but rapid decrease in the number of micro-organisms in the earth strata according to the depth, so that at the depth of one metre the undisturbed soil is always free from bacteria. I have proved this to be the case even in the midst of Berlin, in soil freshly excavated for buildings, cultivation on gelatine of the soil from the depth of one metre showing no bacilli, and only a few solitary colonies of very small micrococci. In one case the earth was taken at 2 metres depth from the foundations of a new house close to the tank *Panke* in the Philippstrasse, at the level of and scarcely 2 metres distant from the water, and yet these specimens of soil proved to be extraordinarily poor in micro-

organisms. It is well to remember, however, that my observations were only made in winter, and it is possible that in summer the facts are different. Nevertheless if, according to the universally accepted view, there is a luxuriant development of micro-organisms in the ground, water, and the earth in its neighbourhood, the spores of these organisms must be left behind, and ought to be found in winter in the lower layers of the soil as easily as they can be demonstrated in the upper surface.

From the numerous extended references we have made, it is abundantly plain that the soil as the source of water-supply plays an all-important part in the question of water-supply, and, as far as evidence goes, is not only the source of enormous—and by far the major part of ordinary—water supplies; but plays a part of greatest moment in the purity of waters, whether in the soil soakage, or superficial flow from it, as creeks, rivers, and lakes. What we have especially learned from these recounted experiments is that to the surface accumulations must we look for those pollutions which ultimately affect the purity of ground water from a sanitary standpoint; but that the extent to which such pollutions become dangerous seems to depend in large measure on the depth of the ordinary ground water, and to some degree the porosity of this soil. That this varies immensely is proved by many facts; but none more than by an occurrence witnessed in 1883, in London West. This village, the soil of which is very sandy, was suddenly one night completely inundated by the rising of the Thames, due to a storm of unprecedented violence. Houses were swept away, wells, cellars, privies, etc., were filled level with the ground. The river remaining high for several days, the falling of the ground water was slow, and London city lent its fire engines to the work of pumping out cellars. One forenoon the firemen began pumping out a 10 ft. square cellar. They pumped half a day, and lowered the water only some three feet; but the water in surrounding wells and privies was lowered to a practically similar degree. Recently again in the chemical examination of water on Homedale island at Brantford, formed largely of river sand and gravel, it was found that water from a certain drive-well showed by examination made by different chemists, and weeks apart, a persistent excess of albuminoid ammonia in the water. Contamination was at first thought to be accidental, but as after several hours of pumping the analysis showed practically the same degree and kind of contamination, the conclusion became inevitable that an adjacent depression which formed a *cul-de-sac* into which waters from a spring flowed during the greater part of the year, supplied conditions for contamination from the fact that an excessive vegetable growth on the banks of this pond to a point increasing with the falling waters of the summer, along with materials washed down by the small creek, caused a large amount of vegetable decomposition. No evidence of sewage contamination existed either from analysis or from surroundings.

Such are these, however, which cause the contamination of creeks, river-waters and reservoirs, and establish a class of conditions of much sanitary interest and importance. What we wish especially to know is what it is which establishes the health qualities of a water from whatever source. Water analysis continues in Ontario to be based upon the principles laid down in England some fifteen years ago, and establishes standards of impurity largely upon the rules of Wanklyn, which fixes the quality on the amount of albuminoid ammonia in solution in the water.

Thus Class I. extraordinarily pure contain 0.00 to 0.05 of albuminoid ammonia per gall.

Class II. most ordinary waters, 0.05 to 0.10 of albuminoid ammonia per gallon.

Class III. dirty waters yielding more than 0.10 “ “ “

Says Parkes the latter is too sweeping a condemnation, and further says, “Decaying leaves and peat produce albuminoid ammonia. Much albuminoid ammonia, little free ammonia and almost entire absence of chlorides is indicative of vegetable contamination.” (Wanklyn.) He says further: “In the water of a pond in Perthshire I found: free ammonia, 0.36; albuminoid ammonia, 2.00, and chlorine only 0.62 per gallon. This had been used for many years without any bad effects observed. Prof. D. T. Ansted, M.A., London, in his classic work on “Water and Water Supplies,” states in his general definition of a wholesome water that “a peaty water, however, of olive brown colour when seen in bulk is not objectionable.” Further regarding water subjected to injurious contact he says: “By afterwards passing through and amongst strata in the interior of the earth,

or simply by passing over the surface in a stream or river, a purifying as well as an injurious effect may be produced, chemical change takes place, new combinations are entered into and the water becomes altered in its composition either for good or evil. This is the case with organic as well as inorganic constituents." Speaking of the purifying action of running water, he says, "River water is constantly receiving a certain quantity of organic matter carried in from the land on the banks, or obtained by the death and decay of various aquatic plants and animals. After exposure to the ordinary action of light and air these offensive matters become combined with oxygen and are thus converted into oxides by a process which closely resembles slow combustion"..... In all cases the waters become purified as they proceed, but the rapidity of the process depends on the conditions of mixture and exposure. *The varying condition of the water accounts for the very different results obtained by chemists as to the distance and time required for perfect destruction of the sewage impurities that enter into a river.*

The English Commissioners, amongst whom was Dr. Frankland, came to the conclusion that the waters of polluted streams were not rendered potable and safe by any mere exposure to the air present in water. A point of still greater interest in this connection on account of the important bearing of microbes on the healthfulness of a water is found in the following statement: "It would seem quite possible that when taken at a particular part of a stream water may appear, even under analysis, to be without any source of serious pollution, while the same water, when it has flowed for some distance without being interfered with may become exceedingly bad without other admixture." This fact has been well set forth in the analyses which were made of the waters of the Ottawa December, 1887, after the widespread epidemic of fever which appeared in the city the first week of November and which continued till the end of the year. The analyses of the waters of this river happen to have been made in September, 1881, and the results of the analyses then made have been compared with those by Prof. Shutt, of the Agricultural College, made of water taken on the 24th of December. In the comparison it will be found stated that in the permanent qualities of the water such as hardness, color, etc., the Ottawa water remained the same in 1887 as in 1881: chlorides were as low as .5 parts per million, while the free ammonia was so small, viz., .0007 per gallon as, says Shutt, to make one conclude that there was no sewage contamination, which was wholly justified by the facts of the case. In the case of the same water analyzed by Baker-Edwards, the ammonia was .0056 in the month of September when decomposition was free. Now when we compare the albuminoid ammonia we find conditions quite reversed. In December the albuminoid ammonia was .0084, while in September, 1881, it was only .0011. We see that this test of impurity in December showed the water to be decidedly below the standard of normal purity, while in the former case its amount was comparatively small. It is instructive to remember that the fever as an epidemic by December 22nd had ceased, and that had analysis been made of the river water on November 1st it would probably have been found that the albuminoid ammonia was much less in amount than at the later date. Shutt found, as we would expect, that the microbes in the water were few in amount in December; but as we have seen from the albuminoid ammonia the food for their development was abundant, and had the temperature been favorable we would have found them numerous present. We think it quite evident, therefore, that locality, soil, season, temperature, place whence taken (as deep well, river, reservoir, creek, etc.) must all be tabulated and the relative importance of each noted, before any very accurate conclusions can be drawn regarding the quality of a water from the sanitary standpoint. In the paper before the Healthier Exhibition by Prof. Odling, M.B., F.R.S., F.R.C.P., on "The Chemistry of Potable Water," he said:—

That the organic matter of potable water is constituted, in the main, of dissolved, unorganised, and non-living matter, does not admit of question. Anything like an adequate discussion, however, of the origin, nature, and possible hygienic influence of this main portion of the organic matter, could not but involve a very long story. It may suffice here to say that, having regard to its origin and nature, and to the minuteness of its proportion, the presumption against any unwholesomeness attaching to its presence is very strong. To what extent living and unorganised matter may be also present; how far such living organic matter may include a something capable of developing zymotic disease; and, admitting all this, how far the liability of different waters to contain more or less of noxious living organic matter is related to the varying amounts which they contain of innocuous non-living organic matter, are questions far more difficult of

solution. They are questions on which, in the present imperfect state of our knowledge on the subject, it behoves every one to speak with caution; but in my own view, having regard to what is observed and recorded respecting the health of differently supplied populations, and to what little is known of the natural history of disease-producing organisms, the preponderance of evidence does not, I think, favour an alarmful answer. Other persons, however, are of a different opinion. But the address which I have been asked to read at this Conference, is on the chemistry of potable water; and my concern to-day is solely with the chemical aspect of the subject. It is not from biologic or pathogenetic inquiries, but from the results of the chemical analysis of the water supplied to London—from the mere determinations of the quantity of its organic matter—that its wholesomeness is month after month, by suggestion, impugned. On this point I join issue altogether. Further, it seems to me an abuse of chemistry, that a chemist who on other than chemical grounds may, rightly or wrongly, have satisfied himself of the unwholesomeness of a particular water supply, should state and summarize the result of his analyses in such a fashion as to make it appear that unwholesomeness, which he really infers on other grounds, is deducible from the results of his periodical chemical examinations. It is well understood that a statement, of which the verbal accuracy cannot be challenged, may, nevertheless, be far from a warrantable statement. It may convey a *suggestio falsi*, and include a *suppressio veri*. Such I take to be the case with the statement, paraded month after month, in what is an official, and should be a scrupulously impartial report, as to the relative “amounts of organic impurity” contained in individual samples of metropolitan water, compared with a particular decennial average amount present in the Kent Company’s water,—a standard, by-the-by, of which the value is known and used only by the reporter, whose comparison, accordingly, it is impossible to check. This monthly statement suggests, I take it, the notion that spring water is the proper type of what river water, or at any rate of what metropolitan water, should be—a notion entirely without foundation, and discordant with the reporter’s own strong recommendation of lake-water for the supply of London. It further suggests the notion that the desirableness and general wholesomeness of different waters are inversely proportional to their relative “amounts of organic impurity,” irrespective of the origin and nature of this so-called impurity,—a notion equally devoid of foundation. On the other hand, the statement in question suppresses the fact that spring-water, lake-water, and river-water, have each their special characteristics, excellencies, and defects. It suppresses the fact that the so-called “previous sewage contamination” of the standard spring-water is as relatively high, as its “amount of organic impurity” is relatively low. It suppresses the fact that the “amount of organic impurity” in the metropolitan river supply, though threefold or fourfold that present in the spring-water supply, is nevertheless almost infinitesimal in absolute quantity. It suppresses the fact that the “amount of organic impurity” in the highly reputed Loch Katrine supply is, during the summer months, in excess of, and is on the average of the year substantially identical with, the summer yearly amounts respectively present in the metropolitan river supply. It further suppresses the fact that the head waters of the Thames, by the time they reach Lechlade, about 22 miles only from their source, and 120 miles above the Companies’ intake have exchanged their character of spring-water for that of the river-water, and irrespective of urban contamination, contain an “amount of organic impurity” identical in quantity with, and chemically undistinguishable in kind from, that met with in the river-water at Hampton. I dispute altogether the notion, suggested by the mode of statement adopted in the monthly reports made to the Registrar-General, that the relative unwholesomeness of the Kent Company’s water, the New River Company’s water, and the Birmingham Corporation’s water, was, during the last eighteen months, approximately as the numbers 1, 2, and 3; or, in other words, that it was in the proportion of the 8-hundredths, the 15-hundredths and the 23-hundredths of a grain of dissolved organic matter per gallon, present in the three supplies respectively. I contend, further, that the New River Company’s water would have been no more wholesome or unwholesome respectively, if, instead of actually containing 15-hundredths of a grain of organic matter per gallon—this organic matter being chiefly of vegetable origin, and a product of ordinary fluvial life—it had contained, like the Kent Company’s water, as little as 8-hundredths of a grain, or like the Birmingham Corporation water, as much as 23-hundredths of a grain of organic matter, the absolute variations of a tenth of a grain or so of such dissolved organic matter per gallon, being too small to have any real hygienic importance whatever.

If it were indeed the fact that the dissolved organic matter of potable water, taken as a whole, is of such a nature that, in the proportions in which it is met with, it is capable, on occasions, of developing and spreading epidemic disease, it is manifest that no plea, based on the actual smallness of its proportion, would be of any avail to save it from hopeless condemnation. It is manifest also, on this assumption, that the determination of the variations in the proportions of organic matter present in a water, notwithstanding the minuteness of even the maximum proportion, would be a determination of the highest significance; and further, that any information furnished in intelligible language to the general public, as to the results of a comparison of different waters with one another in regard to their respective proportions of organic matter, would have an extreme degree of interest and value. But all this is based on the hypothesis that the dissolved organic matter of water, or at any rate the dissolved organic matter of some water, taken in its entirety, is a noxious constituent of the water, capable, in proportion to its quantity, of setting up epidemic disease; a view, it need scarcely be said, which is sustained by no sort of evidence, and supported by no weight of authority. If, indeed, the organic matter of water were really of this noxious character, the conclusions above set forth, with regard to the propriety and value of a comparison of waters with one another in respect to so noxious a constituent, would be undeniable. But if, on the other hand, the minute proportion of dissolved organic matter met with in potable water is constituted mainly of innocuous vegetable extractive, with a trace or more of innocuous animal extractive; and if, at the same time, this organic matter does not affect in any appreciable degree the taste, or colour, or appearance of the water, clearly all variations in the amounts present in potable water, that fall within the limits of an exceedingly minute proportion, are matters of no consideration whatever; and this whether they be variations in the proportions existing in different waters, or variations met with in the same water at different times. And the same conclusion would hold good, even if the organic matter of water, while constituted in the main and at most times wholly, of innocuous extractive, was, nevertheless, liable to include at other times a sub-proportion of an effectively noxious agent; unless, indeed, it could be shown that the liability of different waters to contain this noxious agent was in proportion to their relative amounts of dissolved organic matter—a proposition so preposterous as never to have been seriously put forward. Whether or not there exist any good grounds for calling in question the excellence and wholesomeness of the water

supplied to probably the healthiest great city of the world, is another matter. Speaking as a chemist, I represent that there are no chemical grounds for such a contention. In support of this position, I would call to mind that the last Royal Commission on Water Supply, after hearing very varied evidence, much of it of the usual alarmist character, reported to the effect that the presence of a small quantity of organic matter in drinking water was not necessarily prejudicial; and that there was not any evidence to satisfy them that the particular organic matter present in filtered Thames water was prejudicial. Their conclusion on the general question is expressed in the following words:—"Having carefully considered all the information we have been able to collect, we see no evidence to lead us to believe that the water now supplied by the companies is not generally good and wholesome."

In reply to remarks made on the discussion which followed his paper, Dr. Odling said:

As regarded the general question, the influence of the presence of organic matter in water must depend, not on its quantity but its nature. And any comparisons put forward with regard to quantity, irrespective of nature, fell to the ground altogether. Had there been sufficient time, it was his intention to discuss the question of quality as he had the question of quantity; and he had notes ready for the purpose, but time did not allow of their use. Any general statement, and any conclusion he had formed or expressed, with regard to quality, was formed on a consideration of evidence, and was gone into by him as minutely as he had gone in to the question of the influence of quantity. The gist of the whole question in the present state of knowledge seemed to rest on an observation of effects. Of course if you took one week and compared it with another, or one town with another for a short period, you might arrive at almost any result you pleased; but if you took large populations, and examine the statistics for lengthened periods, it would be found that there was absolutely no difference whatever in the health of the population which could be ascribed to the drinking of river water, or spring water; from which it would seem all these different varieties were, in their different ways, well suited for the supply of large populations.

What, however, is being rapidly recognized is that the sanitary qualities can probably be best recognized collectively by a biological analysis of the water in which the number of living microbes in the water at any time may be accurately made and calculated. Not only this, but this is the only method at present by which the character of the microbes which feed on the albuminous materials in the water can be in any degree made out. To illustrate this point I have selected some comparative analyses of waters made by Thomas G. Nasmyth, M.B., C.M., D.Sc., Medical Health Officer for parishes of Beath, Dalgety and Aberdour, Scotland. The following is transcribed from his report:

Name of Water.—For reference to slides, Kirksburn.

History of Water.—This water it was proposed to introduce into the Village of Cowdenheath. The burn is formed by the collection of various springs, and from the surface of land in good cultivation which form its banks on both sides. Within thirty yards, at one point, there are a stable, byre, and pigsty, and within 150 yards, and at a higher elevation, a churchyard. The supply was favourably reported on by the engineers consulted. A survey and report was made by them, and in their report they referred to the question of nitrates, which, by the analysis, were seen to be excessive. The engineers could not understand why nitrates should be excessive in this case. The sources of contamination mentioned above sufficiently indicate the reason, and it also shows that there should be some other opinion than a merely engineering, one on proposed water supplies.

Analysis of Kirksburn.

	Grains per Gallon.
Total solids	9.76
Volatile residue	1.04
Saline residue	8.72
Lime	1.92
Silica	0.40
Chlorine	0.96
Alkaline nitrates	0.60
Saline ammonia .....	.004
Albuminoid ammonia .....	.0096

This water is suspicious from nitrates, saline and albuminoid ammonia.

Plate Cultivation.—Made April 10, examined April 14, number of colonies 260. The number of drops used in all my cultivations was five, and this result is nearly six times more than the ordinary waters I examined.

Slide Preparations.—Five in number, and showed the following appearance:—

- No. I.—Stain brown. Contains numerous fine bacilli and sarcinae.
- No. IA.—A good slide; shows very small bacilli like B. termo.
- No. IB.—Bacilli; some arranged in clusters; zooglyca;
- No. II.—A very good example of giant cocci, or torulae, showing arrangement of single, double, fours, and clusters.
- No. III.—A few cocci, bacilli; some are very short and straight, others curved and convex at ends some contracted in middle, like B. termo.
- No. IV.—Single cocci; pairs and zooglyca.
- No. V.—Long bacilli, evidently B. subtilis.

Inoculated into tubes with nutrient jelly from points on plate cultivation.

Tube I.—Kirkcuburn. Surface of jelly concave, growth in centre, whitish in appearance, half an inch long, one-eighth long, flat in shape but irregularly so.

Slide.—An impure cultivation, showing both micrococci and bacilli, the latter most abundant.

Tube II.—Inoculation into agar tube. Whole surface opaque but darkest in centre.

Slide.—Bacilli, and like *B. termo*.

Tube III.—Surface opaque; growth extends half inch into jelly.

Slide III.—Very fine and short bacilli.

Tube + slide +; torulæ faintly stained.

Remarks.—This water needed no analysis to condemn it. Its sources were sufficient for this purpose; but the chemical and biological characters show it to be a very dangerous water, containing excessive organic matter and excessive numbers of organisms.

Loch Katrine Water.—Analysis by Prof. Mills, Glasgow. Expressed in parts per 100,000:—

Total solid impurity.....	2.90
Organic carbon.....	.255
Organic nitrogen.....	.030
Nitric nitrogen.....	.004
Ammonia.....	.080
Hardness.....	.95
Chlorine.....	.75

Temperature, 44°42' F.

Loch Katrine water is well known to be one of the purest waters, and the result of my examination of this sample confirmed the opinion. Using the usual number of drops, five, I found only 27 colonies on the jelly; one was liquid; made two inoculations into jelly and made six slides.

Slides I.—A very good slide; bacilli; some short, others long, curved, and others straight. *II.*—Fine bacilli and micrococci. Bacilli like as if formed by the junction of cocci. *III.*—Cocci and bacilli. *IV.*—Cocci and few torulæ and filamentations like *B. subtilis*, and pieces of a mycelium. *V.*—Cocci and bacilli. *VI.*—Some very thick and long bacilli; sharp cut at ends. Also giant cocci or torulæ; inoculation into tube; large, round, and oval torulæ, stained brown.

Remarks.—The chemical analysis and the results obtained by the biological method quite agree, as in only very pure waters do we meet with so few colonies.

Northwell.—This sample was collected at the mouth of the overflow pipe from a cistern in which this water is collected. The water issues from whinstone and is away from any source of pollution. The bottle could not be submerged, so that in process of cultivation some accidental impurities got in.

Analysis of Water.—Expressed in grs. per gallon:

Total matters in solution.....	9.09
Saline matters.....	8.47
Organic of vegetable origin.....	.62
Hardness.....	.5

A water of excellent quality, and fit for any domestic purpose.

Plate Cultivation.—About fifty colonies; but at least ten were mycelial, due to penicillia, aspergilli, etc.

Slides I.—Form of mycelium with spores on free surface. *II.*—Similar to No. 1. *III.*—Torulæ and fragments of mycelium. *IV.*—A good slide: at one part thick and long, bacilli at the other; cocci arranged in groups of one, two, and fours, and some form rods; but this is probably due to bacilli in the process of degeneration.

Coccocrea. Single cocci. Diplococci and streptococci.

Drawing of No. V. slide.

Slide VI.—Micrococci and fine bacilli.

Butter Well.—The water here is of the same character as the North Well, and comes from whinstone. The well is a deep one, situated away from any source of pollution, and is remarkable for coldness and purity of water.

Analysis.—Expressed in grains per gallon:—

Total matter in solution.....	8.14
Saline.....	7.63
Organic.....	.51
Hardness.....	.4

A very pure and good water for all domestic purposes.

Plate Cultivation.—About twenty-seven colonies, some of which were due to mycelia.

Slides No. I.—Consists of mycelial filaments and a few small bacilli. *II.*—Mycelial. *III.*—Cocci, an arrangement in clusters; zoogloæ. *IV.*—Mycelia and torulæ. *V.*—Micrococci and mycelium. *VI.*—Micrococci and mycelium.

Keddie's Well.—As a contrast to those pure waters, the following is interesting:—At the house supplied by this well years ago I had cases of enteric fever which I believed were connected with this well, and at that time I advised its discontinuance. The roof of the well was under the garden; roof and sides built of loose stones.

Of course the danger here is pollution by the manures from the garden. I made a plate cultivation in the usual way in the month of March, and found to my great disappointment the water was pure, and it was only after some days that I explained to myself this unlooked-for result. It was March, and no manure had been put on the soil from the April of the preceding year, so that the chances were, after the month of April this year, the time when gardens are manured, the well would receive its supply of organic matter. I examined, after a short period—during which time there had been heavy showers—sufficient to effect what I anticipated, and on my next plate crop were countless organisms and the following description of slides:—

No. 1.—Short rods like *B. termo*. 2. Bacilli in process of fusion; short and thick, oval at ends. 3. Thick and longish; bacilli; breadth more marked than length. 4. See drawing. 5. Small short bacilli. 6. Bacilli and micrococci; filaments of mucor. 7. Fine faintly stained bacilli and micrococci. 8. Bacilli, short and long, and ditto.

The large number of slides showing bacilli is peculiar, and in my belief the excessive presence of bacilli accompanies organic pollution of water.

F. Well.—This well is remarkable for the coldness and purity of water. It is situated in a field away from any source of pollution, and is undoubtedly pure. The water comes off whinstone same as Butter Well and North Well referred to. The chemical analysis would be very much the same as of those wells. Temperature of water, 51°F.

Plate Cultivations.—After four days showed twenty-eight colonies, eight of which were mycelial, and due to accidental pollution probably. No liquefaction to cover glass preparations. No special description is needed, as all were either torulæ or mycelial.

Manse Well.—The water in this well was suspicious from the following facts: The well was thirty feet deep and situated between the stable and back of Manse water-closet. The pipes from the w. c. were common, unglazed, unjointed tiles, and led into a cesspool by passing under the kitchen floor. The cesspool was about twenty yards distant from the well, the w. c. about five yards, the stable litter-heap about ten yards. The water from this well needed no chemical analysis to condemn it as being dangerous for use.

Plate Cultivation.—Laden with colonies.

I.—Bacilli; some short, others like *B. subtilis*; very clear and distinct bacilli. Drawing. II.—Like No. I. III.—Long oval torulæ, some budding. Long bacilli, some thin, others broad. IV.—Giant cocci or torulæ in ones, twos, and threes; also bacilli. V.—Torulæ or giant cocci arranged as in No. 4 slide. VI.—Bacilli; very beautiful slide.

This water is undoubtedly polluted by sewage and shows an excess of bacilli.

We have here admirably set forth the results readily obtainable by Koch's method of *plate analysis*, and while lacking in a number of the details regarding temperature, season, etc., which we have considered necessary, it points out that free development of microbes may be expected to take place in waters contaminated with sewage, or vegetable matter, and that their injurious qualities may be expected to correspond therewith.

The knowledge, as regards each special variety of microbe, is on the increase, and only when the life history of the various forms of bacteria have been fully studied can we hope to be in a position to speak confidently regarding the accuracy of results of the analyses of waters. Until such time arrives we must continue to depend, as even then we must largely, upon the sum total of conditions affecting the purity of a water before much dependence can, from the health standpoint, be placed on the simple results of the common methods of analysis.

All of which is respectfully submitted,

P. H. BRYCE,
Secretary.

 THE CHAIRMAN'S ANNUAL ADDRESS.

To the Members of the Board of Health:

GENTLEMEN,—In the recently issued Fifth Annual Report the work of our Board, as also that of many of the Local Boards of our Province, has been detailed at a length sufficient to convince the readers that a great deal of the work of investigating the causes and prevention of disease had been accomplished, thus leaving few topics for comment in the annual address.

It is a generally admitted axiom that the work of administration cannot advance far beyond the limits of legislation, that there must be combined action before any great results can be effected by the supplementary Health Act passed at the last meeting of the Legislature. Notwithstanding the successful working of the Provincial Board has been greatly facilitated, a great step in advance has been made and upon evidence being furnished of good work resulting, obstruction and prejudice will in time be greatly diminished, if not generally overcome. It may perhaps rightly be held, that only by visionaries, or as the members of this Board by aldermen and town councillors are more familiarly designated sanitary cranks, can the complete extinction of contagious diseases be accomplished; but of complete success in preventing their spread by early notification, isolation and other sanitary measures, there has been furnished abundant evidence. It may be held to be premature to formulate any conclusions as to the working of the principle of compulsory notification of contagious disease, as in the amended Health Law for our Province enacted, but I may, whilst on this subject, mention that it has been enacted by thirty-nine constituencies in England, and I take as an illustration of the benefit resulting from it, the report of the Medical Officer of Health for Nottingham, Dr. B. A. Whitelegge, who shows by tables and figures that each extension of compulsory notification had been followed by a decided reduction of mortality from the diseases in point, viz.: smallpox, cholera, typhus, typhoid, scarlet fever, diphtheria and relapsing fever.

In years previous to notification, experience shows that both small-pox and scarlet fever were epidemic every few years, the former frequently disappearing almost entirely in the intervals while the latter contributes always its quota to the annual mortality even in the non-epidemic years. Dr. Whitelegge goes on to say:—"Making due allowance for these considerations, we have the following reasons for attributing to the system of notification an important part in the result:—

"1st. The decline in each case commences with the commencement of compulsory notification. The consideration suggested above, with regard to smallpox and scarlet fever, viz., that they may have been taken at the crest of an epidemic wave, does not hold good in the case of enteric fever, which had been slowly gaining ground for several years previously.

"2nd. The decline is continuous. In scarlet fever, we have an uninterrupted fall for four years, the notifications meanwhile becoming more and more numerous in proportion to the deaths, that is, the system has gradually come into full operation.

"3rd. The decline is not merely to the usual level on non-epidemic years, but to a point considerably below it.

"4th. The decline in the scarlet fever mortality is greater than can be accounted for by the general diminution throughout the country. The death rate from scarlet fever in 1885, was in Nottingham 0.13 per 1,000, and in the twenty-eight large towns 0.24.

"5th. The decline which has been so curiously constant in the notified diseases, has not taken place in the other zymotic diseases—whooping cough has largely increased in mortality, and measles has held its ground. These two zymotic diseases not being included among those required by the Health Committee for notification.

"6th. The conditions discovered and dealt with in consequence of notification are such as would almost inevitably in the absence of interference by the sanitary authorities have led to the spread of infection. In the case of scarlet fever, it is in too many instances the exception and not the rule for children to be voluntarily kept away from school until

the infective stage is over, that is until desquamation has entirely ceased. Medical supervision does not, as a rule, extend beyond the earlier or acute stages of the illness, and the friends have little regard for the protracted but still infectious stage of convalescence which follows. Isolation within the household is very frequently little more than a name, and after the first fortnight or three weeks is rarely attempted, nevertheless it is often found that children from infected houses are going to school up to date of the first visit of inspection, and the parents are too ready to send them again without waiting for the termination of the case and proper disinfection of the premises, clothing, furniture, etc. But for notification, the vast majority of such cases would remain undiscovered and a variety of channels of infection would have remained open. Frequently persons attending on a case of diphtheria or scarlet fever, are to be found serving in clothing, provision, and even milk shops without any precautions whatever against transmitting infection. Many severe epidemics have been traced to this reprehensible carelessness."

The above extracts from the Nottingham report, illustrative of the benefits derived from enforced notification, are in complete harmony with other reports from numerous English health officers where like preventive measures are in force, and most certainly triumphantly vindicate the action of the Government of Ontario in the recent Health Act whereby similar measures against the spread of contagious diseases are made obligatory. It is of course to be well understood by municipal officers, that the work of subsequent disinfection of the house and premises in which a case of infectious disease has occurred is not to be left to the untrained, as in that case it may prove totally ineffectual, but to be conducted by a sanitary officer thoroughly versed in the process whether by sulphurous acid fumes, chlorine, heat or bichloride of mercury.

A want of vigilance in dealing with contagion is a necessary result of the non-existence of a proper sanitary service, Provincial and local, armed with the requisite statutory powers, and with sufficient means at their disposal for carrying out the several enactments. Given all these, notification becomes a prime factor in the work of sanitation. In the instance of the poor prompt isolation can be provided for, the thorough removal of all foci of disease can be accomplished, and then the specific germ finding little material to work upon, the safety of a district from a serious epidemic may be almost guaranteed. We had an illustration of the truth of this two years ago in Montreal. For months the Local Board of Health worked most heroically but fruitlessly in their attempt at suppressing smallpox, not by any means from a want of intelligent and well-conceived measures for accomplishing the object in view, but simply from the lack of Provincial executive power. To meet the exigency, a Provincial Board of Health was established, the members of which were advanced sanitarians and furnished with whatever funds they required, as also the necessary mandatory powers for stamping out the disease. Thus armed, but a short time elapsed before the city was released of the incubus. Unfortunately with the cessation of the plague, or very shortly after, the Provincial Board of Health ceased to exist, a very much to be regretted occurrence, not only for the Province of Quebec, but for the entire Dominion. We know that the progress of cholera has been towards the sea ports of the Argentine Republic and of the Gulf of Mexico, and that from these ports there are many steam and sailing vessels bound for New Orleans, New York and other ports adjacent to our boundary lines, also to European ports with which we have commercial relations; there is consequently a possibility of the disease finding access to our Dominion. We have, it is true, at the quarantine station, at Grosse Isle, a most vigilant officer in Dr. Montizambert, who, so far as he may be armed with authority, will do all in his power to prevent the introduction of cholera or any other infectious disease, but it must be remembered that there are many other avenues, and that in the absence of a Provincial Board of Health for the Province of Quebec, there would be absent the requisite executive power for establishing, if need arose, a thorough system of inland quarantine along the line of railway travel. Let us hope, therefore, that the Government of Quebec will realize the danger, and not wait until a dreaded disease has found a footing on our shores before they re-establish the Provincial Board, not for meeting a particular danger, but permanently.

In evidence of what may be accomplished in limiting cholera, I quote a passage from Dr. Thorne Thornes' report of the incidence of the disease in 1885, when it first affected Spain: "Comparison between Gibraltar and the adjoining Spanish town of Linea, shows that with a population of 24,000 persons in Gibraltar, the cholera deaths amounted to twenty-three, whereas in the town of Linea, with only half as large a population, no less than 194 fatal attacks occurred. Owing to the impracticability of preventing communication between Linea and Gibraltar, no measures of land quarantine or other restrictions on the movements of the population were attempted. The limitation of the disease in Gibraltar being clearly attributable to the strict sanitary administration and the system of inspecting and advising, uniformly pursued."

In view then, of the possibility of the introduction of cholera, boards of health, Provincial and local, should give special attention to the condition of dwellings and surroundings, to the character of the drinking water supply, to the objectionable system still adopted in certain places for the removal of night soil, to the continuance of private slaughter-houses amidst the homes of the people, to the state of the sewers, and adoption of permanent arrangements for the regular and systematic flushing, to a proper connection of house drains with the main sewer, to stringent municipal plumbing regulations, to a proper system of ventilation of dwellings and public buildings, to the condition of lanes and destruction of garbage. All of these points have from time to time been brought by our Board to the notice of Local Boards, and on some legislation has been obtained. But as this has been usually permissive only, and the changes required have involved, in many instances, a considerable outlay of money, or have been viewed as likely to create great opposition on the part of the tradesmen concerned, the unsatisfactory and in many cases most dangerous condition to public health still continues. The Local Board of Health of this city has repeatedly sent for ratification to the Executive Committee a much needed Bill for the registration of plumbers, but as yet, I believe, no action has been taken by the Council. Our Board has also suggested that in this city, where so many balloon buildings are springing up like mushrooms, and a number of new houses in the neighbourhood of factories, would, from their general appearance, seem to be of imperfect construction, that there is urgent necessity for legislation providing for their compulsory inspection and registration. To workingmen the rigorous execution of sanitary law is not only a question of health, it is a question of wages, because the stronger the workingman the less he is stricken down by sickness, and the more wholesome his dwelling, the more wholesome the surroundings in which his wife and family are living, the more he will be able to minister to their support. The new Chancellor of the Exchequer, the Right Hon. George Goschen, in one of his speeches during the political campaign in 1885, says:—"I certainly believe that we may put down the increased health and strength of the population as an asset secured by the labour bestowed and the expenditure made, and that we have thus by this sanitary legislation increased even the material resources of the poor, for if the workingman by such sanitary methods is saved twenty days' illness on an average in the year, he has increased his wages by a proportionate amount, and thus added an increased asset in the national balance sheet."

I have somewhere noticed a remark of Captain Douglas Galton, that if legislation is not to be ridiculous, it must be accompanied by increased knowledge in sanitary matters on part both of the persons charged with administering the sanitary Acts, as well as the people themselves. Recognizing the truth of this remark, the members of the Provincial Board have in a variety of ways endeavoured to disseminate increased knowledge of the laws of health. This endeavour, we have reason to believe, has been attended with a very fair measure of success, as evidenced by the large number of municipalities in our Province that have since the first establishment of our Board, created Local Boards, also by the large membership of the Association of Medical Health Officers, first organized last October. In the Hon. A. M. Ross we have, if not in name, for all intents and purposes a Minister of Health, ever ready to assist us in procuring from the Legislature reasonable sanitary enactments, but frequently enforcing the propriety of hastening slowly, of educating the people until the time comes when our requirements will be received as reasonable, and no parliamentary committee will have the heart to refuse them. Acting

on this basis, our Board will continue the work of disseminating sanitary pamphlets, reports, etc., and in time let us hope that sanitary legislation will be the most popular legislation submitted to the House.

All of which is respectfully submitted.

C. W. COVERNTON.

REPORT ON THE QUARANTINE STATION AT GROSSE ISLE, P.Q.

To the Chairman and Members of the Provincial Board of Health.

GENTLEMEN,—Having recently spent three weeks at the Quarantine Station at Grosse Isle, a brief report of the regulations recently issued by the Dominion Government for observance by masters of all ships coming from infected ports, as also of all vessels on which during the voyage cases of contagious disease have occurred during their transit to the port of Quebec, will, I conceive, be found of great interest to the members of this Board. These regulations bear the date of the 18th of July, but I assume owing to delay on the part of the Government printers, were only received by Dr. Montizambert on the day I left the Station, the first week in August. In a letter recently received from Dr. Montizambert, I am informed that instead of the vessels passing the Quarantine Station without stopping for inspection—a matter of daily occurrence during my visit—all but the mail steamers that obtain their clearance at Rimouski, now remain for examination, that a day and night service is now in operation, the duties of the latter alternately performed by Dr. Montizambert and his recently appointed assistant, Dr. Coote. The following extracts from these new regulations will suffice for convincing the residents of our Province that the danger of introduction by the port of Quebec of contagious disease is now reduced to a minimum:—

4. Any person or persons ill with cholera, smallpox or other infectious disease, as defined in the quarantine regulations of May 23rd, 1868, shall be landed at Grosse Isle for treatment, and the vessel disinfected and allowed to proceed or be detained in such a manner as may be deemed expedient by the medical officer for the protection of the public health.

5. No steerage passenger shall be allowed to pass the inspection stations, that is, Rimouski for the mail ships, and Grosse Isle for all other vessels, without furnishing evidence to the satisfaction of the quarantine medical officer of having been vaccinated within seven previous years, or having had the smallpox within that period; and in case when the smallpox has occurred in any vessel during the voyage, this regulation shall also apply to every person on board. The production of a certificate by a ship's surgeon called a "protection card," and his testimony, under oath, verifying the truth of such certificate, may be taken by the quarantine medical officer as evidence of such vaccination and protection. The quarantine officer, however, shall from time to time make personal examination of holders of such certificates to satisfy himself of the manner in which they have been issued.

6. Any person to whom the definitions in the next preceding section would apply as not having shown satisfactory evidence of having been vaccinated within the seven previous years, or having had the smallpox within that period, in accordance with the requirements of such section shall be vaccinated by the examining quarantine officer, or in the event of refusal shall be landed at Grosse Isle, subject to a quarantine of observation, and the expense of the maintenance of such person during quarantine observation shall be a charge against the vessel.

7. The quarantine medical officer at Grosse Isle or Rimouski shall examine any officer or surgeon or medical man of any steamship or sailing vessel under oath, touching the state of health of such ship or vessel and of every person on board in such form as shall be prescribed by the Minister of Agriculture, and it shall be the duty of the pilot

on each such steamship or sailing vessel to hand to the ship's officer or surgeon a printed copy of the questions required to be answered under oath.

8. Every steamship or sailing vessel arriving with infectious disease shall be liable to be detained at the quarantine station for disinfection, together with its cargo and passengers and crew, but every steamship or vessel provided with one isolated hospital for men, and another for women on the upper deck, ventilated from above, and not from the door only, may, in the discretion of the quarantine medical officer, if he is furnished with satisfactory evidence that such hospitals have been promptly and intelligently made use of, be allowed to proceed after the landing of the sick and the disinfection of such hospitals; any vessel, however, arriving with infectious disease without having such special isolated and ventilated hospitals, or having them without satisfactory evidence that such hospitals have been promptly and intelligently made use of, shall be liable to be detained for disinfection at the quarantine station.

9. The master of every steamship or sailing vessel arriving from any port outside of Canada shall produce a certificate of quarantine inspection and clearance from Rimouski, in the case of mail steamships and from Grosse Isle in the case of all other vessels before being allowed to make a customs entry at the port of Quebec or Montreal.

10. A second quarantine inspection shall not be held to be necessary at Quebec, but in the event of the inspecting physician there in pursuance of his port duties finding infectious disease, as defined in Section 4 of these regulations in any steamship or sailing vessel, he shall promptly order it to go back to Grosse Isle.

11. Every steam or sailing vessel from any port outside of Canada arriving at any regularly organized quarantine port having quarantine station, that is to say, at Halifax, Pictou, Hawkesbury or Sidney, Cape Breton, in the Province of Nova Scotia, or Charlottetown, in the Province of Prince Edward Island, or Victoria, in the Province of British Columbia, shall be subject, in so far as they can be made, to apply to the foregoing regulations relating to the St. Lawrence as respects inspection by quarantine medical officers of the several ports or harbours, before being allowed to make a customs entry; and any vessel which it shall be considered necessary to detain, shall be dealt with in accordance with the quarantine regulations of 1887 aforesaid.

12. At every other port in Canada at which there is not a regularly organized quarantine station, and at which the collector of customs is authorized, by the proclamation of 21st January, 1873, made in pursuance of Act 35 Victoria, Chap. 27, such proclamation being continued in force by Section 11, 49 Victoria, Chap. 68 of Revised Statutes of Canada, the collector, in the case of any steamship or sailing vessel arriving from any port known to be infected, and of which notification is published in the *Canada Gazette*, cause a medical inspection to be made of such vessel, and shall not grant a customs entry, except on the production of a clean bill of health after such inspection.

15. Rags coming from countries or ports in which infectious diseases prevail as defined in Section 4 of these regulations, the names of such countries or ports being from time to time published in the *Canada Gazette*, shall be prohibited from landing at any port in Canada, but rags collected in countries which have been free from the prevalence of such infectious diseases during the six months prior to the shipment of such rags, shall be admitted without any special treatment, if accompanied by a proper evidence of origin.

16. Hours of day service at quarantine station shall be between sunrise and sunset—excepting at Grosse Isle, where inspection will be made during any hour of the twenty-four.

17. Every pilot shall be furnished with printed copies of these regulations, one of which it shall be his duty to hand to the master of every steam and sailing vessel coming from a port outside of Canada immediately after going on board of such vessel, under a penalty not exceeding two hundred dollars.

Every collector of customs or master of steam or sailing vessel charged with putting into effect or having any duties in connection with the foregoing regulations, shall be liable to a penalty not exceeding four hundred dollars and imprisonment until such penalty is paid, for any contravention of such regulations or for omission or neglect of duty in relation to them.

The above are the most important of these recently issued quarantine regulations, and will, I think, be held by the members of this Board as the best calculated for protecting our Province from invasion of infectious disease. In order to obtain a satisfactory knowledge of the quarantine practice prevailing in British Columbia and of the disinfecting appliances there in use, the Acting-Deputy Minister of Agriculture contemplates, I have heard, making with Dr. Montizambert, an inspection of the quarantine ports of that Province and providing similar means to those now in use at Grosse Isle. In relation to these at the latter station in my letter to the *Mail* and *Globe* last month, I commented on some particulars of the process now in use there.

1st. That the sulphur-dioxide blast apparatus should not be on the quarantine steamer, but placed at the end of a deep water wharf, where more space could be given and the danger of the steam launch lying alongside the ship being by the motion of the waves, set on fire.

2nd. That the engine placed in the steam launch was neither of modern construction nor of sufficient power for the purposes required.

By recent letter from Grosse Isle I am informed that the Minister of Agriculture and Acting-Deputy Minister have within the last week made a visit of inspection of the station, and have expressed themselves as highly satisfied with the admirable disposition at the two ends of the island of the various administrative and executive offices and buildings. The Minister considered further the "Hygeia," the steam launch, as too small and weak; proposed having it lengthened and widened, and made as strong as modern ship building science could make her. With them these contemplated alterations of the inspecting steamer and the carrying out the existing wharf a sufficient length to enable large ships to lay alongside the end where the dioxide-sulphur blast apparatus would be placed, as also a steam washing and drying apparatus, this station may be fairly placed, from its natural position and appliances, as the best on this continent.

The only remaining precaution against possible importation of smallpox into this country, is one that Dr. Montizambert, on the occasion of the meeting last autumn of the American Public Health Association in this city, informed us that the steamship company whose vessels came to the port of Quebec would require, viz.: The holding of a certificate by cabin passengers of vaccination within seven years or revaccination by surgeon of ship, unfortunately became inoperative in consequence of the quarantine officers of some American ports vehemently opposing.

All of which is respectfully submitted.

CHAS. WM. COVERNTON.

The subject was further reported upon at a subsequent meeting.

MR. CHAIRMAN AND GENTLEMEN,—At the last meeting of our Board I brought to the recollection of the members the action taken on the last day of session of Convention of American Public Health Association, held in our city in the month of October, 1886, relating to the importance of State and Provincial Boards of Health co-operating in their efforts to prevent the spread of contagious diseases by immediate notification of the presence in their midst of any such malady.

That, with the exception of the Local Board of Health of City of New York, all other Local and State Boards in the United States had loyally fulfilled their promises to that effect, but that from the Health authorities of the aforesaid city no reliable information could be obtained in regard to rumours that smallpox for a long time had been

present in certain quarters of the city, the said disease introduced by emigrants from Europe, but its existence denied, or misleading answers given to repeated application for information.

That from this unpardonable reticence on a matter that involved the safety of the people of this continent, and from other more direct sources of information, our Board had reason for apprehending that at the said port of New York very inadequate precautions against the entrance of epidemic disease were in operation, and that as we had sufficient intimation that the danger of cholera being brought to our ports was anything but visionary, it was very desirable that the representatives of our Board at the convention of the American Public Health Association, to be held in the month of November, at Memphis, Tennessee, should be instructed to bring before the assembled State Boards this vitally important subject, two resolutions on this subject were proposed and carried. Dr. Oldright, of the two delegates appointed, was the only one to accept the trust, and from his report of the meeting, as published in one of our city medical journals, we learn that whilst the evidence adduced at that convention on the subject of quarantine prevention was most conclusive, while at the stations of New Orleans, Louisiana, and of Grosse Isle, Province of Quebec, the most judiciously conceived and carefully executed precautions against the admission of infectious maladies were constantly in operation, at the port of New York, where the daily arrival of steam and sailing vessels from all parts of the world was the largest on this continent, a most dangerously lax system there prevailed, which from all the health officers at the convention assembled, met with the most severe condemnation. At this meeting a pamphlet containing a full description of the system of disinfection practised by Dr. Holt, in New Orleans, was circulated among the members, a copy of which was mailed to me by that energetic quarantine officer, and now have the pleasure of submitting to you for inspection.

Three years ago last October, when present at the annual convention of the American Public Health Association, held at St. Louis, Missouri, as representative of the Dominion Government, I obtained from the same gentleman drawings of the fumigating furnace, reservoir, and exhaust fan which, at that time, he had in use at New Orleans, copies of which, on my return, I forwarded to the Minister of Agriculture at Ottawa, recommending an appropriation for a similar apparatus for the station at Grosse Isle. Two months subsequently, Dr. Montizambert was associated with me as Dominion representative at a meeting of the officers of all the States Boards of Health convened at Washington, D.C., when for the first time he had an opportunity of seeing and having explained to him by Dr. Holt a model of the aforesaid apparatus, with which he was so captivated that, by perseveringly recommending it to the Government at Ottawa, he last year succeeded in obtaining, as also a steam launch with said furnaces on board. The objections to the apparatus being on deck of launch I had an opportunity of noticing last summer when on a visit to Dr. Montizambert at the station, and which, in a letter to the *Globe* newspaper sometime in August, I fully described, and also mentioned the imperative necessity for having the western wharf repaired and carried out a sufficient distance to permit vessels, on board of which cases of cholera or smallpox had occurred during the voyage, to ride at anchor in deep water at low tide during the process of disinfection by bichloride of mercury and sulphurous acid gas, as also a building containing superheated chambers for purification of bedding, furniture, curtains, baggage and wearing apparel placed in a Troy laundry situate at extreme end of wharf, also requisite other buildings under same roof or in near proximity for disinfection of other portions of cargo.

The Honourable Mr. Carling, Minister of Agriculture, last autumn visited the station, inspected wharves, hospitals, detention houses, as also the separate buildings in cholera bay, quite distinct and a long distance apart from all the other buildings, and was made fully acquainted with the various requirements for making Grosse Isle Station second to none on this continent. These changes, however, involve a large expenditure of money as also an immense amount of additional labour, viz., greatly increased vaccination duties, and raise the number of vessels to be inspected from twenty to thirty in the season to at least a thousand, as under the new regime inaugurated last summer no vessel can pass the station without obtaining clearance, or if they run past without showing a

light during the night, would be heavily fined and sent back from Quebec to Grosse Isle ; thus the work all around the twenty-four hours is greatly increased, for to prevent detention of ships a day and night service, from beginning of April to about first or second week in November, is necessitated.

The large additional grant required, without full information supplied to the public for its absolute necessity, may possibly cause the Government to hesitate in making all the changes as promptly as the protection of the inhabitants of our Dominion, from a visitation of a cholera or smallpox epidemic, unmistakably point to under a less vigilant and thorough system.

The duty of furnishing reasons for the expediency, if only from an economic point of view, of such an outlay naturally devolves upon the two Provincial Boards at present organized in the Dominion, viz., that of Ontario and Quebec, the other provinces, so far as I am aware, not as yet having fallen into line.

Dr. Lachapelle, the Chairman of the Quebec Board, has, I believe, taken the initiative, and I have, no doubt, that at this the first meeting of the present year our Provincial Board will follow suit. Entertaining this belief, I have briefly pointed out the opinions expressed at all the meetings of the State Provincial and International congresses that I have attended for the last five years and six months, commencing at the September meeting of the European International Congress at Geneva in 1882 ; American International in St. Louis, in 1884 ; two in subsequent years at Washington ; meeting at Brighton in England, August, 1886 ;—that strictly in principle if not in uniform detail have been insisted upon as the most reliable means of protecting countries from the entrance of epidemic diseases, viz. : the careful segregation of the sick from the healthy, and skilled attention to the work of disinfection under the most approved system.

Dr. Oldright, in his report of the Memphis meeting will still further accentuate the harmony of opinion that there prevailed on this subject.

It can be no matter of question that by the constant vigilance of such health officers as those now holding the position of quarantine physicians at New Orleans and Grosse Isle, Province of Quebec, and similar watchfulness at the various ports from the Gulf of Mexico to Cape Breton, success in preventing entrance of epidemic disease is most likely to be accomplished.

All of which is respectfully submitted.

CHAS. WM. COVERNTON,
Member of Committee on Epidemics.

REPORT OF THE COMMITTEE ON EPIDEMICS AND OF THE SECRETARY RE ANTHRAX AT GUELPH.

To the Chairman and Members of the Provincial Board of Health :

GENTLEMEN.—The farmers and people generally in Guelph and its vicinity have, as will be seen by the following letters, been much exercised regarding a disease which, beginning last summer, has again broken out with fatal effect amongst cattle pasturing on the river flats along the Speed and below the city of Guelph. These flats, which in many parts are flooded in the spring time, receive the drainage from the town by the more westerly branch of the Speed, as also the waste waters from several mills and factories emptying into the river after its branches have joined.

Prof. Grenside, of the Veterinary Department of the Agricultural College, last year treated, as stated in his letter, several animals that died, and in a letter to the *Mercury* has well set forth the character of the disease as seen and understood by him. Mr. D. McCrae, manufacturer, Guelph, first communicated the facts to me regarding the

disease, and enquired what steps, if any, should be taken by the Local Board of the township in which these cases occurred—his father, Thos. McCrae, Esq., chairman of the Board, being ill. I answered him to the following effect, and stated that I would endeavor to visit the district at an early date. I visited Guelph on the 16th ult., and with Mr. McCrae and Prof. Grenside, visited the flats, and interviewed Mr. Parsons, who had been a heavy loser last year by the disease, and who, unfortunately, with his partner, Mr. Harvey, contracted the disease through skinning a dead animal and aiding Prof. Grenside in making a post-mortem. A weed (probably wood-nettle), with stinging hairs, grew about the spot, and stung their arms, and it is assumed that by these wounds the empoisoned blood affected the two gentlemen. Prof. Grenside strangely enough escaped inoculation. Mr. Parsons was very ill, and bears scars of the pustules upon his hands and arms still.

The facts regarding the cases are much as stated in the two letters, and all that I have learned coincides with the statements made by the best authorities regarding the particulars of the disease. Accepting Prof. Grenside's opinion as to the character of the disease, we find just such anomalies in its appearance as are found in European countries.

Anthrax in Great Britain.

The following quotations on the subject are from the Report of the Agricultural Department of the Privy Council :

“First it may be stated positively that anthrax is not infectious, that is to say,

To the Editor of the Mercury :

DEAR SIR,—Between the old Budgeon Farm and the Edinburgh Road, along the river flats, for the past two seasons there has been a mysterious fatality among the cattle.

Last year Mr. Harry Dawson was a considerable sufferer, as also were Messrs. Parsons and Harvey. I cannot give you from memory the exact numbers that each person lost, but I should say that between thirty and forty animals died, and in addition to the parties above, Mr. O'Boyle, Mr. Felix Delvin, Mr. Brisbin, Mrs. Pinder, Mr. Sleeman, Mr. Wilhelm and Mr. Simpson, all lost cattle, Mr. O'Boyle several horses and Mr. Brisbin some valuable pigs. This year Mr. Hilborn, who has the field occupied last year by Mr. Pinder, has lost four head, and Mr. Dawson has lost no less than eight within the last few weeks. Mr. Brisbin and some other person have lost a horse each. I have not heard of any others. The disease seems to act very rapidly ; in most cases the animals have died within a few hours of being taken sick, and so far the veterinaries have been puzzled, for although they have been called in they were powerless to save the animals, and nothing has been done to arrest the disease. Several carcasses have been opened, but apparently to no purpose.

Both Messrs. Parsons and Harvey were affected from handling their cattle and were ill for weeks from blood poisoning, and Mr. Dawson's hired man is now suffering in the same way.

The disease in most cases seems to take the form of a running black throat, with lumps breaking out through the neck. One of the persons openly stated his belief that his animals had been poisoned, and did not hesitate to name the offender, but this I cannot believe, as surely there could not exist a fiend who would deliberately destroy a lot of valuable animals for the purpose of wreaking a paltry spite against one individual.

I think the cause must be sought in some poisonous plant or parasite, perhaps more fully developed by the extreme heat of the last two summers, or else in the water which is being drunk by these poor creatures, being contaminated by poisonous chemicals, which, it is an undoubted fact, find their way into the river, but whether they are sufficiently powerful as to affect such a large body of water to such a distance it is impossible for me to say. The facts are sufficiently alarming to call for the immediate and thorough examination into the disease with a view to ascertain the cause, and if possible to pro-

animals in contact with others which are diseased do not suffer unless some of the blood or tissues of the diseased animals enter their blood. Even eating food containing the germs of the *bacillus anthracis* appears to be insufficient to induce disease unless there are abrasions in the mucous membrane of the digestive organs through which the spores can enter the blood stream."

"Anthrax exists on the continent of Europe and in many parts of the world in a much more virulent form, and spreads more rapidly than it does in this country.

"In France the annual losses among sheep are estimated at 30,000,000 of francs. Under these circumstances it is evident that we are exposed to the risk of the introduction of the disease by the agency of various products which may carry the spores of the bacillus anthracis. Wool, skins, fodder, litter and manure are the most likely to be infection carriers, and it is obvious that we are entirely without the means of protecting ourselves against the sources of danger, unless we could adopt the policy of prohibiting the introduction of all the substances referred to from any foreign source.

"No better illustration of our want of power to protect even human life from a known danger from foreign products, can be adduced than is afforded by the history of the "wool-sorter's disease," which is now ascertained to be anthrax, due to the introduction of the spores of the bacillus anthracis into the blood during the process of sorting the wool. Nothing can be more simple than the explanation of the origin of the affection. Bales of foreign wool are made up of wool clipped from the living sheep, shorn in the usual manner; but they also contain sometimes wool clipped from skins

vide a remedy, and I write this letter to you to draw the attention of whatever authority is the proper one to deal with it. Whether the Board of Health would consider it within their province to take the matter up or the Dominion or Ontario authorities would act I cannot say, but it struck me that with a staff of scientific Professors at the Agricultural College, if they were to devote themselves to discovering what is wrong, they would do their neighbors incalculable good and obtain considerable *kudos* for themselves as well as reflecting much credit on the institution to which they belong.

I apologise for the length of this letter, but think the importance of the subject warrants its publication.

Yours truly,

FRED J. CHADWICK.

Rockmaple, July 30, 1887.

P. S.—Since writing the above I learn that Mr. Dawson lost a valuable mare with precisely similar symptoms.

DR. GRENSIDE ON THE FATALITY AMONG CATTLE.

To the Editor of the Mercury:

SIR —As Mr. F. J. Chadwick has drawn public attention to the fatality among the cattle and horses along the river banks, in the vicinity which he lives, a few remarks from a veterinarian may not be out of place.

There is no doubt that this local outbreak has been a serious one, as considerable losses have resulted from it; but it is also certain, that a number of the animals that have died in that vicinity during the last two summers have not been the victims of the particular disease that constitutes the chief cause of alarm.

I have attended and made *post mortems* on a number of the animals that Mr. Chadwick refers to as having died, and can testify to the cause of their death being entirely different in some cases to the disease that has caused the major portion of the trouble, viz.: anthrax.

A number of the cases that I had an opportunity of examining *post mortem*, and a number that I have not, have no doubt died from the malignant malady generally termed Anthrax.

or from dead sheep, some of which died of anthrax. It is only required that a little blood from a sheep dead of anthrax should be on the wool and such contamination could hardly be avoided, and the wool sorter who happens to have a scratch on his hands while he is engaged in picking it, infects himself with anthrax.

"An outbreak of wool sorter's disease at Bradford some years ago excited a good deal of attention at the time on account of the appearance of anthrax among cattle, which were feeding in a meadow, to which flowed the washings of the wool factory, where the wool sorters suffered from the same disease. In consequence of this occurrence it was suggested as a means of preventing the communication of the disease from foreign wool, that the Privy Council should prohibit the landing of wool from diseased animals. If the suggestion had been well considered by its authors, it would never have been offered, as it must have been perfectly obvious on reflection, that the Privy Council have no means of enforcing such an order. Possibly the introduction of infected wool into the manufacturing districts might be to some extent prevented by inspection at the landing places; but that expedient would merely divert the risk of wool sorters disease from the factory to the ports.

"Anthrax occurs periodically in some districts, and even on certain farms or particular pastures. Sometimes a single animal of a large herd will be attacked, and succumb in a few hours, and the disease will cease, only to reappear after some months or years have elapsed. In some instances the affection implicates a large number of animals before it ceases. Occasionally all the live stock of the farm, including horses, which are not very susceptible to the disease, have been destroyed. It is therefore impossible, when an outbreak of anthrax occurs on a farm, to determine what course it is likely to take, or what proportion of the stock have incurred the danger of infection. Generally, however, the disease does not extend beyond the farm on which the outbreak occurs.

"In regard to the origin of anthrax, it is generally very difficult to select from the number of possible agencies those which are most likely to introduce the disease. When

Anthrax literally means a boil; the name was derived from the manifestation of this disorder in man as malignant carbuncle. This name is in pretty general use throughout the world, but is not such a happy designation as *Charbon*, the term used by the French, for the local lesions are usually of a coal black hue.

There is no specific disease that has such a wide range of subjects, for no animal from man downwards seems to be insusceptible to its baneful influence.

Another peculiarity is the variety of forms in which it manifests itself; sometimes showing itself chiefly in connection with one organ or set of organs and sometimes with another.

One of its commonest forms is Splenic apoplexy, in which case the spleen becomes engorged with blood of a black color, and tarry consistence.

Then there is *Enteric Charbon*, when the bowels are the chief seat of trouble.

The tongue is also the seat of the chief local lesion, in other cases constituting Gloss-anthrax; and the lungs in some lingering instances have been found affected.

Black Quarter or Quarter Ill was looked upon until recently as being another manifestation of the same disorder; but although there is a close resemblance in some respects still it differs in the important respect that the essential cause is not identical in both cases.

I do not intend to ask for space to give the symptoms, as the cause of the malady and its prevention are the most important points to dwell on.

Mr. Chadwick asks the attention of the Faculty of Agricultural College to investigate this trouble, but this is quite needless, for there is no specific disease, of which every particular is understood more thoroughly, than the one we are treating of. Centuries have been spent by the foremost scientists of the world in investigating it, but it is only of recent years that all its mysteries have been unravelled; and now veterinary literature is teeming with accounts of it.

The essential element in the production of Anthrax is a minute vegetable organism, which from its rod or staff-like form is called a *bacillus*. This, gains access to the

it is known that every article of food, water, litter or manure may contain the spores of the bacillus, and that worms may bring them to the surface from a carcase which has been buried for years, it becomes evident at once that the enquirer has a very critical and delicate investigation before him, in which the chances of success are rather remote.

"Anthrax is not a disease which can be eradicated like most animal plagues by the adoption of the stamping out system. Diseased animals die so quickly that nothing would be gained by slaughter, and those in contact with them frequently escape the disease."

On the outbreak we are considering there are a number of points of practical interest from the public health standpoint.

From the extended reports of investigations into "Wool-sorter's Disease, or Anthrax," found in the tenth report of the Local Government Board for Great Britain, it is made apparent that in the large centres of the woollen industries there the disease has become one of such importance as to demand special regulations, made with a view of protecting the wool sorters.

These investigations made it apparent that the dangers are wholly from foreign wools from the Cape and eastern parts, as of Turkey and Syria.

To the degree that these are used in Canadian factories, the persistent vitality of the spores of the *anthracis bacillus* makes the danger a positive one here as elsewhere. The fact that there are in Guelph woollen factories which to some extent use foreign wool; and further, that the washings find their way into the Speed above the infected flats, naturally make us suspect these as the carriers of the disease, if anthrax it be.

As however, there have been, as far as I could gather, no cases of wool sorter's disease there from handling wool, it would be unwise to draw inferences which we are not in a position to verify.

system, which is possible through an abrasion on any part of the body, as in inoculation; or it can be conveyed into the circulation by the digestive tract—the usual channel—all going to show that it cannot be breathed in, as the germs of some diseases can; it now reproduces itself, and causes fermentation of the blood, which it so alters in character that it becomes incapable of supporting life. This organized poison acts very rapidly, for those that have made experimental inoculations testify that usually death is brought about in from twenty-four to forty-eight hours.

This organ has two ways of reproducing itself. In a living being it increases by dividing into two parts, these two parts then sub-divide, and so on, rapid increase taking place. Outside of a living body, and where a bacillus has food to use, little spots are observed to form within its coat, and arrange themselves in rows like peas in a pod, and when they are ripe the covering membrane bursts, and frees these atoms of matter, which are the spores or seeds. These spores being taken into a suitable host become bacilli. Bacilli spores are extremely tenacious of life, prolonged drying won't kill them, and Pasteur says they will withstand boiling.

The next practical point is how did the germs of this disease get along the river flats.

In the present stage of science we can hardly urge the almost exploded theory of spontaneous generation. I have already stated that all the particulars in connection with this disease have been explained, but this point is an exception, and we cannot tell where the seeds of anthrax are and where they are not; but observation has determined under what conditions they usually become active agents for doing harm.

Our experience in this country with this disease amounts to a mere nothing, when compared with the countries of Europe. From all accounts as great losses have been sustained in a week's time from this disease in France alone, as in this Province during twenty years. In France it is stated that a very warm summer is never seen without *Charbon* being prevalent, and that it occurs on land that has been inundated, and then become dried up from prolonged dry weather.

From personal investigation of the methods of cleaning the wool there, one may fairly conclude that, apart from the fact that man is one of the animals which have a considerable immunity from the disease, the cleaning of the wool by a fan and by subsequent washing, has so far been proved efficacious in preventing cases of anthrax amongst the sorters—if in any instances its germs have been present in the wool.

From the veterinary and agricultural standpoints, the question has wide bearings and deserves further consideration. The sudden and quickly fatal onset of the disease makes it possible that the disease will be spread to persons, either through milk or meat.

To obtain positive information, however, on the subject of the true nature of the disease, it is most desirable that in addition to the clinical facts already supplied by Prof. Grenside, a biological examination of the disease be made, and I would recommend that this Board authorize its committee on epidemics to obtain samples of blood should any further cases occur, and take such measures for its culture and examination as will put the Board in possession of the actual facts.

I have the honour to be your obedient servant,

P. H. BRYCE,
Secretary.

The history of last summer's as well as this summer's mortality along the flats of the river shows that these conditions existed.

Proof that these particular bacilli are the cause of anthrax has been most satisfactorily shown, as the following test will show: A drop of blood, or other fluid tissue taken from an anthrax subject, and that contains the bacilli is placed in some suitable nourishing material as beef tea, and allowed to stand for a time, the bacilli will have increased in numbers. A drop from this is then taken, and placed in a similar fluid, when the bacilli soon multiply; this can be carried on for any number of times until say twenty cultivations have been made or twenty fresh generations of the organisms produced. Although only a small drop is passed from one lot of cultivation fluid to another it suffices to fertilize it. Now if a drop is taken from the twentieth cultivation fluid and an animal is inoculated with it, it will produce the identical disease; and if the blood of the inoculated is examined microscopically, it will be found to contain the characteristic bacillus. This certainly is undoubted evidence that these bacilli are the essential element in the production of this disease.

The great French scientist, Pasteur, conceived the idea that the bane might be made its own antidote. So he went to work, and by particular processes weakened the virus, so that although it would produce disease, it did so in such a mild form when inoculated, that no ill effects resulted; and when a subsequent inoculation of the deadly poison was made, in an animal so treated, it was found to be immune, as no derangement of health was manifested. When Pasteur made the announcement of this discovery, it was not accepted until he gave a public demonstration of its accuracy. A number of scientific men were chosen by the Academy of Sciences in Paris to watch the experiment.

He was given fifty sheep, twenty-five to receive protective inoculation with the weakened poison, and the other twenty-five to receive no vaccine as he termed it.

After sufficient time had been allowed the whole fifty were inoculated with the strong poison. His success was complete, the twenty that had been protected appeared to experience no ill effects, while those unprotected or not vaccinated all died.

This was considered conclusive proof of the efficacy of the method, which became generally adapted in practice, and is said to have reduced the death rate by forty per cent. amongst the sheep of France. It was also successfully applied to cattle.

Medicinal treatment has always been found very unsatisfactory, no good effects resulting from any known medicinal agent.

In the present outbreak the only practicable means of prevention is to remove the cattle from the source of infection. If cattle were not allowed access to these flats,

On the receipt of the following :

GUELPH, Aug. 23rd, 1887.

MY DEAR BRYCE,—I am sending you by this mail a vial of blood taken from another anthrax victim that died lower down the river. The spleen was filled with tarry-like blood, and was ruptured, a considerable quantity of blood having escaped from it into the abdomen. We noticed the blood as soon as we cut through into the abdomen, but could not find where it had come from until we examined the spleen.

This blood is what escaped into the abdomen. I imagine I detected the existence of bacilli in it. Kindly let me know the result of your observations, and oblige,

Yours sincerely,

F. C. GRENSIDE.

I made arrangements for an examination of the blood. The following is the report thereon :

To the Provincial Board of Health of Ontario.

GENTLEMEN,—In accordance with the request of the Committee on Epidemics I have made a careful examination,—biological and experimental, of the blood received from Dr. Bryce, the Secretary of your Board, which was sent down from Guelph, and can without hesitation after my investigation pronounce the blood to have contained the spores and rods of the disease known as anthrax or splenic fever.

Taking a small quantity of fluid from the vial on a sterilized platinum point I made a microscopical examination and detected in addition to blood corpuscles, two varieties of bacteria,—in both cases *bacilli*, the one with rounded ends and possessed of great activity, and the other bacterium somewhat thicker with square cut ends, without molecular movement. The former variety corresponds to the bacteria, always present in decomposing blood, and the second variety were as the sequel proves the bacilli of anthrax. I inoculated three rabbits with the fluid in the vial, two kittens and two guinea pigs. With a pair of scissors I removed the hair from a small portion of the skin of the back, and after having washed the cleared surface with a solution of corrosive sublimate (1-1000), in most of the animals, I took a lancet which had been thoroughly sterilized in the gas flame, and made a pocket beneath the skin. Into this I passed a platinum point which was covered with a minute quantity of the suspected blood. Two of the rabbits, on the second day appeared languid with loss of appetite, but the following day they were again lively. The seat of inoculation of the third rabbit was on the second day red and tumid,—the condition passed away in three days (five days after infection). The kittens remained free from all indisposition.

which have proved so dangerous, during the dry weather, the chances are there would be no losses to record.

In two cases last year I recommended removal of the cattle to other fields, but the owners hesitated about following my instructions, on account of the scarcity of feed ; but they were soon forced to do so by additional losses, and as soon as the change was made there was no more trouble.

It is a matter of extreme importance to dispose thoroughly of the carcasses. It has been found that even where they are buried deeply that the seeds of the disease are carried to the surface by worms, and act as a source of contagion for years afterwards.

The most effectual plan is to burn the dead animals, but thoroughly covering with a thick coat of quick-lime, and burying deeply is the next best.

I am sorry I could not make a satisfactory explanation of this trouble without taking so much of your space.

Yours truly,

F. C. GRENSIDE, V. S.

One guinea pig died in eighteen hours, and on making an examination of the body I found the lungs congested; there was a quantity of serum in the pleural cavities,—there was no tumor or redness at the point of inoculation at any time. I examined the serum of the pleural cavity in stained and fresh preparations under the microscope and observed some short rods, and a vast number of thread-like bodies. Specimens were also made from the blood of the heart and liver, and organisms were seen similar in shape to the shorter ones noticed in the serum. A second guinea pig was then inoculated with the serous fluid taken from the one just dead, and it died in sixteen hours. A similar condition of the internal organs was seen on opening the body. A third guinea pig was then inoculated from the second, and it died in ten hours. One of the guinea pigs first infected showing no evidence of disease, its blood was examined, and as no organisms were detected it was re-inoculated from the blood of the third guinea pig which had succumbed, and when in a dying condition (twenty-four hours later), the blood was again examined and micro-organisms were readily seen which corresponded in all details to those noticed in the fluid taken from the vial. Although the virus had passed through a series of four animals its appearance and also its action had in no way been modified.

Two medium sized potatoes were selected and after washing them in water they were soaked for fifteen minutes in a solution of corrosive sublimate, rinsed in water and placed in a steam sterilizer for half an hour until cooked,—they were then removed and inoculated with fluid from the vial after the manner recommended by Koch, and given in detail by Hueppe.* A very characteristic growth resulted from the inoculation of these sterilized potatoes in two days, —a light yellowish layer formed over the surface. This on microscopic examination was seen to consist of some threads, short rods, and an abundance of spores.

A peptone solution made from Moore and Savory's dry peptone, two per cent. and cane sugar one per cent.† and infected from the vial,—eighteen hours later on examining a drop of the fluid the long rods were again seen.

Nutrient jelly made as recommended by Koch,‡ was used, tubes were inoculated, and prepared plates made. A typically characteristic appearance was obtained,||—cell slides were prepared, (see Hueppe), and examined under the microscope, when on watching the spores for thirty minutes, after a fresh inoculation of a peptone solution, in one of the cells a commencing formation of rods was noticed.¶

From the appearance of the spore formation which took place in the cell slides and on potato, from the characteristic growth of the organism on potato, and its typical development in nutrient jelly, from the course of the disease in the guinea pigs, and from the appearance under the microscope of the blood in stained and fresh preparations, I am readily enabled to decide that the disease was anthrax.

It will be plain from the experiments and facts already stated that we have present in the Province a disease which during the past years in France, Germany, and elsewhere has caused widespread loss among the sheep and cattle, which economic loss has been so great as to have caused the Governments of said countries to have instituted the most extensive measures with a view to destroying the disease by protective vaccination. The Government of France has instituted a system by which from Pasteur's Central Laboratory in Paris virus is regularly sent out to experts throughout the country who are required to perform the inoculations in infected districts. The success of the method has been such as to cause me to state that while at present the disease in Canada is localized to several flats along the river near Guelph, it would seem to be the duty of your Board to make such recommendation to the Government as would enable the Board to institute in the

* Die methoden der Bakterien—Forschung von Dr. Ferdinand Hueppe.—Wiesbaden)

† Micro-organisms and Disease by E. Klein, M.D., F.R.S. (page, 19).

‡ The formula is given in full on (page 76.) Pathological mycology by Woodhead and Hare.

|| Crookshank's Manual of Bacteriology (page 283).

¶ Über den Miltzbrand Von C. Eberth. Sammlung Klinischer Vorträge. Richard Volkman, No. 213.

interest of public health, both as regards men and animals, inoculation experiments upon such latter as are likely to be exposed to infection on the suspected pastures.

I have the honour to be, gentlemen,

Most respectfully yours,

W. H. B. AIKINS, M.D.

To the Chairman and Members of the Provincial Board of Health.

GENTLEMEN,—Your Committee on Epidemics has, as directed at the last meeting, had experiments made with the blood of anthrax victims, and desire to present for your consideration the report of Dr. W. H. B. Aikins, as printed above.

Your Committee would urge the propriety of the Board's adoption of the suggestion contained in the report that the matter of protective inoculation be considered, and that it be referred to the Committee on Epidemics for further action in the premises, and, with the consent of the Minister of the Department, to devise such means as will be most likely to place the matter in the best position for the attainment of practical results as regards the protection by inoculation of exposed animals.

All of which is respectfully submitted,

FRANCIS RAE.

CHAS. WM. COVERNTON.

PETER A. BRYCE.

REPORT OF THE COMMITTEE ON EPIDEMICS *RE* THE OUTBREAK OF DIPHTHERIA IN NIPISSING DISTRICT.

TO DR. BRYCE,

Secretary Provincial Board of Health :

DEAR SIR,—In compliance with the instructions contained in your letter of the 29th ultimo, addressed to me at Orillia, I at once proceeded to North Bay and commenced my tour of inspection. Immediately on my arrival I called upon the Rev. Joseph Bloem, P.P., from whom, however, I was unable to elicit any further information than that contained in his letter to yourself. I then called upon Drs. Carruthers, Harvey, and McMurchy, all of whom assured me they had not seen a case of diphtheria in two years, and were not aware of any existing in North Bay or vicinity. I also called upon Mr. John Ferguson, reeve of North Bay and the township of Widdifield, and made enquiries as to whether his council had met the requirements of the Public Health Act of 1884, in organizing a Board of Health, appointing a medical health officer, etc. I found this had not been done, and I urged upon him the importance and necessity of taking immediate steps in the matter in view of the existing unsanitary condition of the village, and the possibility of an epidemic of contagious disease breaking out at any time. The village consists of about 1,500 inhabitants, many of whom are employees of the C. P. R. Company, and their families. These dwell, principally, upon a sandy plain, or intervale, in the neighbourhood of the Railway, which at some former period probably formed part of the bed of Lake Nipissing. There are very few wells in existence, and these are mere holes dug in the sand, and doubtless supplied by the water of the lake percolating through the sand. The majority of the inhabitants are, however, using the water from the Railway Company's tank, which is pumped from the lake, and which is often in a stagnant condition. The higher portion of the village, to the north of the railway, is built upon a narrow plateau, consisting almost entirely of gneissoid rock. Everywhere may be seen the rock cropping out at the surface, and where the rock is not seen, it is hidden by merely a very superficial covering of earth. I was informed that in wet seasons the depressions everywhere became filled with water, which soon became stagnant. No provision has as yet been made for drainage. Notwithstanding this, however, the place has so far been remarkably exempt from zymotic diseases, but this must certainly be due rather to the healthfulness of the climate than the sanitary condition of the village ;

and unless some means be adopted for securing some system of drainage and a better water supply, their present immunity from contagious diseases cannot long continue, as the place is growing rapidly. I supplied the priest, reeve and physicians with copies of the pamphlets, all of whom expressed their appreciation of it and promised to make a good use of them. I also supplied the priest with disinfectants and some of the more simple remedies to be used in the treatment of diphtheria, as in his missionary tours through the more remote districts he not infrequently comes in contact with the disease, and as he is a man of excellent education and more than ordinary intelligence, I feel confident that in acceding to his request for them I was not making a mistake.

I then proceeded to Powassan, a scattering hamlet of about 150 or 200 inhabitants, 22 miles south of North Bay. I at once called upon the leading man of the place, Mr. Wm. Clark, a merchant, etc., who corroborated the information given by the Rev. Father Bloem as to the four fatal cases in one family two weeks before; and from him I learned the following additional particulars: Alfred Mitchell, a settler, living near the village, had been working at a sawmill in Gravenhurst, when he was taken ill, and returning to his home complained of sore throat, etc.; but as no medical man was within reach, the nature of the disease was not discovered. A few days after his return, his eldest child, a little girl of about nine years, complained in the same way, and on the following day another was down with the same disease. On the day following, these two died, and the only two other children in the family were ill from the same disease. Dr. Toole, of Sundridge, was sent for, but only arrived a short time before the death of the two last, which occurred within a few minutes of each other and just as the father had returned from burying the first two. The neighbours had suspected the nature of the disease, and had been very cautious about carrying on any further communication with the house than was absolutely necessary. They had been burning sulphur and using carbolic acid freely. Dr. Toole confirmed their suspicions as to the nature of the disease; and as it happened that there was an epidemic of catarrhal cold, with slight inflammatory sore throat, prevalent at the time, a panic ensued, as every one who was at all unwell imagined they were the victims of diphtheria. For some days the excitement and anxiety were intense, but as nobody died and recovery soon took place, the panic soon abated, and when I reached there the health of the community was good, and every one was rejoicing that the disease had not spread beyond the family where it appears to have originated. The inhabitants of the place, and Mr. Clark in particular, seem to be very intelligent and fully alive to the importance of sanitary measures, and only too willing to carry out the instructions given them. I distributed a number of the pamphlets, which they seemed to appreciate very highly, and expressed their thanks to the Provincial Board of Health for the interest taken in them. I left with Mr. Clark a supply of disinfectants and some remedies for the treatment of diphtheria, should any other cases occur, as they are situated so far from medical aid, the nearest physician to the north being 22 miles and to the south 25 miles, and these are not always to be had when sent for. I am confident a good use will be made of the medicine should necessity arrive.

I next visited Sundridge, a village of about 500 inhabitants, twenty-five miles south of Powassan and forty-seven south of North Bay. I was informed by Dr. Toole, the local practitioner, that he had been nearly two years in the place, and had not as yet seen a case of diphtheria in the village; but a few weeks ago he had eight cases in one family living about four miles distant, two of which were fatal. The origin of this outbreak was as follows. A member of the family, a married daughter, had been living on Cockburn Island, Lake Huron, and diphtheria was epidemic in the neighbourhood in which she lived. She returned home on a visit, and before she arrived she was taken ill of diphtheria, and communicated it to every member of the family; but no cases occurred beyond this family. Dr. Toole is of the opinion that the fumes of burning sulphur which they had been employing as a disinfectant in the house during the illness of the two last patients had either caused or hastened death. The other six cases, though equally severe, had made a good recovery before the sulphur was used. He also thinks the sulphur fumes had something to do with the fatality in Powassan, as in his opinion, as far as he was able to see and learn, the severity of the cases did not warrant such sudden and unexpected fatality. Dr. Howland, of

Huntsville, confirmed this opinion, and informs me he has had cases occur in his own practice a year or two ago in which he was confident the sulphur fumes had caused aggravation of the symptoms and hastened the fatal issue, since which time he was always very particular not to allow sulphur to be burned in a house where he had a case of diphtheria.

From Sundridge I proceeded to Burk's Falls, and waited upon Dr. Campbell, who informed me that he had not seen a case of diphtheria in that village or the surrounding country for upwards of a year. The village and district are in a remarkably healthy condition, and zymotic diseases of any kind have scarcely ever been known there. A Board of Health has, however, been organized for the village of Burk's Falls and township of Armour, with Dr. Campbell as medical health officer, which has up to the present time remained inactive.

At Huntsville I was informed by Dr. Howland that he had not seen a case of diphtheria for the past three months. During the summer he had seen some mild cases, which had not spread, and none had been fatal. He also informed me that he had at the present time several severe cases of typhoid fever in that village, and that Dr. Harte, the second medical practitioner, had several under his care, but none as yet had been fatal. Otherwise the village and adjacent country had been quite healthy.

At Bracebridge I found Dr. Bridgland had just returned from burying his only son, a little boy of nearly six years, who died the day previous from diphtheria. He informed me that during the past two weeks seven families in Bracebridge had been visited by the disease. In all there had been ten cases, three of which were fatal. He had no doubt he had carried the disease home from a patient he had been attending. As soon as his son took ill he sent the other children, little girls, away from the house, and so far they were quite well. His own case was the last in the village, and at present it is free from it. He had used every precaution both in his own home and those of his patients to prevent the spread of the disease, and was in hopes no fresh cases would occur. There had been no cases in the surrounding country for some time.

At Gravenhurst I called upon Drs. Cornell, Grant and Hooke, all of whom assured me they had not seen a case of diphtheria for some months, and were at a loss to know how it originated in the case of Alfred Mitchell. Gravenhurst has thus been for some time in a perfectly healthy condition.

I left them all copies of the pamphlet, and they expressed their appreciation of them.

I have the honour to remain
Your obedient servant,

C. SCHOMBERG ELLIOT, M.D.,
Acting Inspector.

Orillia, Dec. 7th, 1887.

REPORT OF COMMITTEE ON SEWAGE AND WATER SUPPLY *RE* OTTAWA FEVER OUTBREAK.

To the Chairman and Members of the Provincial Board of Health :

GENTLEMEN,—The outbreak of fever, investigated by your Committee, will, as seen by a subsequent statement of Dr. Robillard, Medical Health Officer of Ottawa, be noticed to have exhibited a remarkable suddenness of onset, and to have shown a general incidence in its appearance over the whole area of Ottawa and those suburbs supplied wholly or in part with water from the Ottawa river, obtained from a common supply pipe. Thus, in the tabulated report of one physician, 120 cases occurred during the four months, but only 11 cases had occurred prior to November. During this month 68 cases occurred. But the suddenness of the onset is still more marked, when it is stated that up to the 6th of November only three cases are reported, while between that and the 14th, 22 had come under his care.

From this it would appear that the epidemic dated from the beginning of the second week of November. Your Committee wish this point to be made plain, since the Local Board of Ottawa has been attacked with some degree of severity for dilatoriness in taking

action to investigate or to call the attention of this Board to the outbreak, and formally request an investigation to be made, which was done on the 5th of December. The formal request to investigate is dated December 9th, but owing to the illness of your secretary the enquiry was unfortunately delayed. It might have been more satisfactory had a careful and exhaustive enquiry been instituted early in the season, when organic matter in a decaying state, either in the water or on the soil, was at its worst stage; but especially before it had been removed after decay by the rising water of the later autumn, and before the frost had sealed up the river and reduced the decomposition of vegetable matter to a minimum.

The investigation was begun on the 27th December, and continued for several days.

The wide-spread character of the outbreak in November at once employed all the available medical skill of Ottawa and vicinity, and thus it was not until several weeks had passed that any idea could be gained of the total extent of the outbreak. The widest difference of opinion existed even at the time of our visit, the two limits being 500 to 1,000 cases. From Dr. Robillard's report, since received, it will be gathered that 1,272 cases have been reported, and that when the returns are complete 1,500 will probably have been reached—or one for every twenty inhabitants in a population of, say 30,000, or one in thirty with a population of 45,000. When it is further noticed that only about one in every hundred cases occurred in children under five years, and that ordinarily in a city about one-half the population is under that age, it will be seen that the incidence of the fever was really as one to every ten persons above five years. When it is further remembered that not more than one in eight occurred under ten years, we have the disease attacking a still greater proportionate number; but when we find that most of the cases were in persons under thirty years, and over fifteen years, its incidence probably has amounted to one case in every five persons between these ages.

In order that your Committee might have some correct idea of the prevalence of the disease, a circular was addressed to physicians by Dr. J. Sweetland, chairman of the joint committee of the Local Board of Health and the Water Works Committee for Ottawa.

The evidence obtained from the several reports received during the presence in Ottawa of your Committee was sufficient to indicate the wide-spread character of the outbreak, which was more than confirmed when information was obtained regarding its prevalence on particular streets. Thus, on a single street in one of the newly-built up portions of the city, the Chairman stated cases had existed at Nos. 41, 43, 44, 45, 50, 54, 55, 60, 61, most of which were houses with first-class plumbing, which your Committee inspected, while one or more were tenements with out-door privies. By a visit to the hospital your Committee similarly found that almost all the cases resident there were fever. The same might be said of several other streets specially visited by your Committee, which fact is further sufficiently indicated by Dr. Robillard's summary of the cases (as far as locality was given) returned by the twenty-five physicians reporting.

Report of Dr. Robillard, Medical Health Officer.

OTTAWA, Jan. 17th, 1888.

P. H. BRYCE, Esq., M.D. :

DEAR DOCTOR,—I regret that the returns we have had from the medical men of the city, in answer to your request, are wanting in many of the details necessary to give them much importance in a statistical point of view, many of them merely making mention of the total number of cases attended. Unfortunately, the circular did not ask for dates, locations or mortality rate, and where this information has been obtained it has been by special request. From these I have made a list of the streets whereon cases occurred, and the number of said cases, which, with the aid of a city map, will in some measure enable you to form an approximate estimate of the area covered by the disease which apparently prevailed all at once throughout the city irrespective of the conditions of localities, occurring seemingly as frequently in houses most favourably situated as in those occupying much less enviable positions. Thus we find the disease in houses where human skill had exhausted itself to satisfy the demands of sanitary science so far as

drainage and plumbing is concerned—in houses where drainage was defective and in many more having no connection whatever with city drains.

We have had returns from twenty-five physicians, reporting a total of 1,137 cases		
Reported from R. C. Hospital.....	88	"
" Protestant Hospital	47	"
Total	1,272	

There are yet four physicians to hear from, two of whom have large practices, and I have no doubt that with all returns the number of cases would reach at least 1,500. This, you will understand, includes suburbs, *i. e.*, Rochesterville, Stewarton and Mount Sherwood, which are not as yet within the limits of the city proper.

The mortality rate will be found very low, 25 deaths being recorded in the reports received; 17 of these occurred within the limits of the city according to the mortuary returns for December. The time covered by reports is the last three months, with the exception of half a dozen cases in September. As to the comparative number of cases occurring in each of the last three months, reports fail to give more than an approximate estimate. Thus, in October, we have 28 cases reported; in November, 682; and 262 in December.

I am glad to inform you that the epidemic has altogether disappeared, a number of convalescents yet remaining. No other contagious disease reported lately.

Reported Names of Streets on which Fever occurred.

Albert St., 23 cases.	Division St., 1 case.	Lisgar St., 5 cases.	Somerset St., 6 cases.	Spark Street, 10 cases.
Arthur St., 2 cases.	Elgin St., 5 cases.	McKenzie St., 1 case.	Slater St., 13 cases.	York St., 2 cases.
Alice St., 2 cases.	Eccles St., 2 cases.	McTaggarth St., 1 case.	Stewart St., 6 cases.	Victoria St., 4 cases.
Bay St., 4 cases.	Elm St., 2 cases.	Friel St., 1 case.	Sherwood St., 4 cases.	Percy St., 1 case.
Britannia St., 2 cases.	Bolton St., 3 cases.	Besserer St., 5 cases.	St. Patrick St., 6 cases.	King St., 7 cases.
Bank St., 8 cases.	Augusta St., 6 cases.	John St., 1 case.	St. Andrew St., 2 cases.	Lyon Street, 3 cases.
Clarence St., 7 cases.	Gloucester St., 13 cases.	Nicholas St., 14 cases.	Sophia St., 1 case.	Nelson St., 4 cases.
Cooper St., 14 cases.	George St., 1 case.	Nepean St., 5 cases.	Sussex St., 7 cases.	McLaren St., 4 cases.
Cumberland St., 9 cases.	Daly St., 27 cases.	Le Briton St., 2 cases.	Theodore St., 4 cases.	Frank St., 1 case.
Catheart St., 3 cases.	Cambridge St., 4 cases.	O'Connor St., 1 case.	Redpath St., 1 case.	Chapel St., 1 case.
Cobourg St., 2 cases.	Lloyd St., 4 cases.	Ottawa St., 1 case.	Lewis St., 1 case.	Cliff St., 1 case.
Church St., 14 cases.	Metcalfe St., 11 cases.	Kent St., 3 cases.	Walter St., 2 cases.	Vittoria St., 1 case.
Creighton St., 1 case.	Maple St., 1 case.	Queen St., 5 cases.	Water St., 16 cases.	Gilmour St., 1 case.
Dalhousie St., 5 cases.	Murray St., 1 case.	Rideau St., 22 cases.	Wellington St., 15 cases.	
Duke St., 2 cases.	Maria St., 20 cases.	McKay St., 1 case.	Milbroke St., 16 cases.	

Yours truly,

A. ROBILLARD.

Being desirous of obtaining some knowledge of the system of sewerage, your Committee examined the plans in the City Engineer's office. As is common to all our cities and towns, it was found to be largely wanting in any systematic attention to a graded capacity, and includes several systems. 1st.—There is the main sewer (Banks street), of nearly two miles extent, a four feet arched brick sewer, which receives the great proportion of laterals from Wellington, Elgin, etc., into which again laterals are carried to these as mains from such streets as Cooper street. 2nd.—There are a number of short streets in the newer part of the city near Stewarton, for instance Lewis street, draining into the Rideau Canal (deep cut), a body of still water at this point, which also receives a number of private drains direct from houses along the bank. 3rd.—And belonging properly to the latter, a watercourse in Stewarton becomes an open sewer in part of its length to the discomfort and detriment of near residents.

Then on Wellington street toward lower town, a number of private residences with drains leading no one very well knows where; also along the course of the aqueduct in the bottom of which is laid the wooden water-pipe through which water is drawn, not forced, a number of drains have to some extent turned it into a sewer in parts of its course.

Rochesterville suburb has no sewers, though situated on the incline to receive the general drainage from the contiguous higher ground of the city. The creek (called Brewery creek), is its sewer to receive whatever may reach it by soakage or by direct deposit in it from a public school, a tannery, the city dumping ground, or the swamp where the creek starts.

Such are the various principal sewerage areas and their character. What the present condition of the sewers is, has been much discussed. The City Engineer has stated that the main sewer has been traversed and examined, and that the laterals were found to have no evidence in them of accumulations, the sewage running from them freely. Evidence is not wanting, however, to lead to the belief that some of them may not be properly constructed as regards levels, but your Committee can, of course, express no positive opinion on this point.

The house drains similarly with the sewers have been under discussion. In many cases they are undoubtedly bad, being laid by private persons, in any manner thought proper at the time. Numbers of them are box drains for carrying off cellar water, or are untrapped tile drains. No doubt these defective drains have been, as everywhere else, a factor in the causation of the fever, and demand a systematic inspection by thoroughly qualified sanitary officers, and defects remedied under a strict plumbing by-law.

To illustrate this defective state of affairs, your Committee were informed that a large educational institution had until a year ago a cedar-log house drain, and a close inspection of the existing plumbing of the same building showed that a great reform in the system of plumbing within the building is urgently demanded. The students suffered largely from the fever; but it must be remembered that they were all at an age, as we have seen, when persons are most liable to fever, as also the very large general prevalence amongst those between 15 and 30 years.

In other cases, as stated by Dr. Robillard's statements, your Committee found on close and minute inspection of the plumbing of several houses where fever had occurred, evidence that every precaution had been taken to have the plumbing of a thoroughly first-class character.

In this connection it must be mentioned, as stated by Dr. Robillard, and definitely affirmed by one physician whose report is before your Committee, that nearly one-fifth of his cases occurred in houses in no way connected with city drains.

The milk supply of the city was not examined into by your committee further than to obtain the information from the Medical Health Officer that the milk dealers are licensed, and that the Board had instituted during the past year a regular inspection of cow byres and milk shops. In only one instance, under the notice of the Local Board was fever found in a milkman's house in one of the suburbs, while the total number of milkmen is considerable.

The superficial and subsoil organic deposits, as garbage and the contents of privies and soakage therefrom, are a fact of some importance to be considered in the summation of predisposing causes to fever at a period of the year when the atmospheric conditions

seem to specially tend to putrefactive decay in organic deposits, and to the multiplication of those microbes generally conceded to be the universal cause of fever; but especially is this the case where, with a subsoil water unusually low, drainage from privies and cesspools, extends laterally to a greater extent than when the soil is filled after the spring rains. The absence of any regular municipal scavenging system, and of a destructor by which accumulations of organic refuse in and about the suburbs may be prevented must not be forgotten.

The public water supply of the city, in view of the sudden and general outbreak of the disease in the second week of November, naturally received, in the light of all modern teachings and experience in relation to outbreaks of typhoid and other fever, a large share of the attention of your committee.

As will be observed from the accompanying plan, the aqueduct, along the bed of which a wooden water pipe bound with iron hoops is laid, runs for 400 yards from the bay above the Chaudiere to the pumping house.

The breakwater at the bay end of the aqueduct, extending to the deep water channel, serves to create a quiet body of water, which permits, as stated in a report made for the Government, published in 1881, by D. B. Edwards, Montreal; T. C. Keefer, C.E., Ottawa; and Lewis Lessage, Montreal Water works, on the Ottawa Water works, the settling to the bottom of the larger particles of suspended matter. (It may be recalled to the recollection of the Board that the year 1881 was a fever year, the later summer months and September being unusually dry and hot.) The drought was not, however, so prolonged as during 1887, nor was the spring of the year marked by that absence of rains which characterized 1887. As however, the river was low that year, though not so low as in 1887, it will be of interest to examine the analyses of the water made that year, and during December of this year. The difference which might apparently result from analyses being at different seasons, ought, perhaps, to be against the latter, inasmuch as while the river water had not only risen before it froze up in the end of November, the decay of the river vegetation was by this time complete, and its decomposition must have been at its height several weeks before this, that is about the time when the fever became general.

I propose to refer to samples of water, taken in both instances, in the presence of the city engineer, and from the same place.

Analysis of Ottawa Water, 1887.

A.—From east side of slide channel, between 200 and 300 feet above mouth of aqueduct and about 600 feet from the north branch of the Rochester Creek, taken at a depth of about 5 feet below the surface.

B.—From mouth of clear water pipe or inlet, in front of screen, at a depth of 10 feet below the surface.

C.—From the tap in pumping-house.

D.—From tap in basement of city hall.

	Grains per Gallon.				Parts per Million.			
	A	B	C	D	A	B	C	D
Colour in 2-ft. tube		Dark	Yellow.			Dark	Yellow.	
Smell at 100° F.		Slightly	Peaty.			Slightly	Peaty.	
Chlorine .....	.035	.035	.035	.035	.5	.5	.5	.5
Phosphoric acid		None.				None.		
Nitrogen in nitrates and nitrites ..	.0080	.0103	.0126	.0109	.1152	.1482	.1811	.1564
Free ammonia .....	.0014	.0014	.0007	.0007	.02	.02	.01	.01
Albuminoid and ammonia .....	.0091	.0084	.0084	.0084	.13	.12	.12	.12
Oxygen absorbed in 15 minutes ..	.1912	.1610	.1708	.1629	2.732	2.372	2.440	2.327
Oxygen absorbed in four hours ...	.3519	.3507	.3507	.3507	5.028	5.010	5.010	5.010
Solids	3.80	3.70	3.92	3.92	54.0	53.0	56.0	56.0
Hardness as calo.	1.64	1.40	1.55	1.55	23.4	20.	22.1	22.1

Analysis of Ottawa Water, 1881.

No. 1. Taken at mouth of Water Works suction pipe inside of Screens 9 feet down.

No. 2. Taken 50 feet N. W. of saw log sorting gate or boom, 3 feet down.

No. 3. Taken in crib slide channel, E. side, at pier about 140 feet directly in front of Water Works piers (that is, 150 feet from their northerly limit) 12 feet down.

No. 5. Taken in Water Works Aqueduct about 75 feet from sluices to turbine wheels, 6 feet down.

No. 6. Drawn from basin tap on Wheel House off city main.

Parts per Imperial gallon = 70,000 grains.		Nos. 1 and 4	Nos. 2 and 3	Nos. 5 and 6
1. Colour in 2 feet column	Light	Yellow.	Deeper & Ochreous.	
2. Odour at 100° F	Slightly	peaty.		
3. Chlorine as Chlorides	4	5		6
4. Phosphoric Acid	none.	none.		none.
5. Nitrates and Nitrites	none.	none.		none.
6. Ammonia .....	.0050	.0052		.0056
7. Albuminoid Ammonia .....	.0010	.0011		.0012
8. Oxygen absorbed at 80° F .....	.0040	.0050		.0050
9. Hardness by Clark's test	3.5°	3.5°		3.5°
a10. Solids in Solution	4.8	3.2		3.6
b11. Solids in Suspension	4.2	4.0		4.6
c12. Microcosms	Chiefly	vegeta		ble.

7th September, 1881.

BAKER EDWARDS.

Selecting a few of the more salient points of these analyses, we would observe that in what might be termed the permanent qualities of a water, such as hardness, color, phosphoric acid, solids, the Ottawa has continued to be the same in 1887 that it was in 1881.

The *chlorides* are present in both instances in very small amounts. Though, as pointed out by Mr. Shutt, the frozen brewery creek may account for an absence of chlorides in December, when local surface drainage from privies, etc., did not exist, yet in all probability the amount of sewage contamination at any time from this source would not be appreciable by chemical analysis in the river water at the intake pipe.

The *free ammonia*, in Mr. Shutt's analysis in December, is notably in small amount, and he takes it to be another evidence of freedom from sewage contamination. The greater amount of it in Mr. Edward's examination is manifestly due to decomposition in September being at its height—while at December 22nd it would not to any extent be taking place.

Albumenoid Ammonia.—Manifestly the amount of this in a water becomes the measure of its possibly dangerous character, as all experience attests; since, with certain conditions of season and temperature, its presence determines the free development of bacteria—some of which may at any time be pathogenic, or, as Hueppe believes, become pathogenic. Now there can be no doubt that the unprecedentedly dry spring and summer, associated with the fact that the yearly decreasing amounts of timber along the streams which are the head waters of the Ottawa, are lessening its volume, encouraged the growth along the banks and shallows up the river to an abnormal degree of algae and other aquatic plants, as well as exposing to the sun broad surfaces of previously deposited vegetable debris, (sawdust, remains of plants, wood, etc.) What this meant in October and November we can in some degree judge from what remained

as late as the 22nd of December, when the albumenoid matter (ammonia forming compounds) was nine times greater than in September, 1881.

Dr. Hueppe, at the recent meeting of the German Scientific and Medical Association, is quoted as saying in effect, that the bacteria which accompany intestinal decomposition may cause disease, and that here the distinction between saprogenic and pathogenic bacteria is wholly effaced, and that it must be granted, for the whole class of cases from the simplest diarrhoea to cholera nostras, that no line of demarcation can be drawn between putrid intoxication and specific infection, and he further believes that the specific bacteria owe their origin to putrefactive bacteria.

Regarding the dangerous character of this river as regards the presence of albumenoid matter in amount, Mr. Shutt says: "Many waters contain less than .05 per per million, and .1 part per million causes a water to be looked upon with suspicion, while .15 would, according to Wanklyn's standard, condemn a water for drinking purposes"... Judged also by this standard (*i. e.* absorption of oxygen) it is obvious that the Ottawa water in its present condition is unfit for drinking purposes, owing to the large excess of dissolved vegetable organic matter."

The biological analysis made by Mr. Shutt shows the presence of bacteria present in small amounts, and were this fact not carefully considered in all its bearings, a very false idea of the character of the water might be given. That the water on the 22nd of December contained a small number of bacteria would be expected from the very small amount of free ammonia, the constant evidence of rapid putrefaction in albumenoids. Both result from the fact that at this period the temperature of the water had become such as to practically cause the multiplication of bacteria in the water to cease, though not necessarily fatal to the existence of those already present. But on this point Prof. Prudden's experiments on Hudson river ice last year, showed clearly that the farther down from the source of sewage contamination as Albany, in other words, the longer the period after contamination, the fewer the bacteria in the water (or ice) became.

Similarly the total amount of albumenoids is no criterion of the dangerous character of a water, since from the experiments of Dr. Ellis and Prof. Wright on Toronto water, it is seen that while the bell-buoy water in organic matter was 22 by Wigner's scale, and has no bacteria, yet the water of the eastern gap, toward which bay water with included sewage flows, was 39 of Wigner's scale, thereby falling within the first-class waters and yet showed 5000 bacteria per c. c. These experiments may be taken as showing on the one hand that the almost ice-cold water of the bell-buoy in the spring time when these experiments were made, might have contained enough of albumenoids to develop bacteria if temperature had been favourable, while on the other, the warmer sewage poured into the bay had developed bacteria freely, which bacteria were still existing in the water at a time when chemically, it might be considered first-class.

It is extremely unfortunate that a biological test of the Ottawa water was not made at the time of the outbreak early in November.

Regarding the practical conclusions to be drawn from all the data before us, there are several inferences that seem to be fairly deducible.

1. That the outbreak of fever was remarkably sudden, and was spread, without any localized excessive prevalence, over the whole area of city and suburbs receiving its water supply by means of the Ottawa water-works system.
2. That nowhere, except in cities like Pittsburg during last autumn, and Plymouth, Penn., two years ago, where in both cases contaminated river water was the cause, were there during the past year such sudden and widespread outbreaks of fever as at Ottawa.
3. That the characteristics of the fever, regarded from its fatality (there having been recorded only fifteen deaths in Ottawa for November from this cause) point to contamination of drinking water with vegetable, rather than with animal organic matter.
4. That the chemical and biological examinations point similarly to excessive contamination of the river water by vegetable organic matters.

5. That the excessive dryness of the past season developed more than is usual conditions in the Ottawa which favoured the outbreaks when decomposition of this matter was at its height.

6. That sewage contamination from the villages along the shore above the intake pipe (*e. g.*, Rochesterville to Mechanicsville) must have added something to the dangerous character of the water at this period—it having been further shown that three cases of typhoid were treated during early September in houses situated on the banks of Brewery creek.

7. That no other insanitary condition (though probably aiding in individual houses, or perhaps neighbourhoods, the development of the disease, since “everyone will now admit that putrefaction is a predisposing cause of infectious disease”) has been shown to exist that will adequately account for the sudden and wide outbreak of fever.

8. That the most eminent practical sanitarians assert that bad water is the exciting cause in at least 75 per cent. of all outbreaks of typhoid fever.

9. That the evidence obtained by your Committee points to the necessity of obtaining for Ottawa a water supply less subject to contamination from local sources, or by the fluctuating conditions of amount and purity incident to a river supply.

(Your Committee understands that lakes situated upon gneissoid strata, can be readily and economically reached across on the Hull side of the river.)

10. As the albumenoid ammonia of water is not a suspended but dissolved impurity, filtration will not remove this source of contamination, though it would lessen the amount of suspended impurities. No ordinary household filter is of use for any other purpose, but all are objectionable on the ground that the filter becoming filthy, often causes the water to become more dangerous than it was previously. In the meantime, the use of boiled water for drinking purposes ought to be regularly adopted.

11. That a system of city scavenging and the erection of a destructor for garbage are urgently demanded.

12. That a systematic house to house inspection of drains and plumbing ought to be at once instituted and a record preserved of conditions found.

13. That under a competent inspector, the provisions of the by-laws relating to house drainage and plumbing should be rigidly enforced, and at the same time local defects in main sewers should be remedied.

14. That as long as the Rochesterville creek is allowed to be utilized as a sewer, with the water pipe where it is, its outflow should be led into a sewer which would similarly receive laterals which now tend to contaminate the aqueduct.

15. The wooden pipe along the aqueduct should be tested as to its soundness and freedom from leaks.

16. That the Stewarton creek nuisance should be abated and the sewers fouling it, as also that of Lewis street and others now emptying into the deep cut, be led by an intercepting sewer to a point below the city.

17. That as the presence of defects in house drains is always suspected, where typhoid or diphtheria occurs, the Local Board should insist upon its notification of cases by householders and physicians, in order that inspection can be instituted and remedies applied.

18. That a register and map of cases on streets and houses be made so that an exact knowledge of localities and the incidence of disease may be obtained.

All of which is respectfully submitted.

J. D. MACDONALD.
P. H. BRYCE.

REPORT OF COMMITTEE ON SEWAGE, DRAINAGE, AND WATER SUPPLY
 RE FERGUSON AVENUE SEWER NUISANCE IN BAY AT HAMILTON,
 MAY, 1887.

TORONTO, 10th May, 1887.

To the Chairman and Members of the Provincial Board of Health.

GENTLEMEN,—Your committee appointed to investigate the nuisance alleged to arise from the outfall of the Ferguson Avenue sewer, in Hamilton, beg leave to report as follows :—

Your committee visited the locality of the mouth of the Ferguson Avenue sewer, and found that the nuisance complained of is caused by the sewerage being driven back on the adjoining shores and depositing there its more solid portions. We found men engaged in carting away the deposits and were shown pits in which large quantities of it lie buried.

This sewer carries the sewage of about 15,000 people. Nuisances arising from its outfall cause great annoyance to persons residing in the neighbourhood.

Your committee are of opinion that, looking at the matter purely from a sanitary point of view, the preferable method of dealing with the sewage is by chemical precipitation; the sewage to be compressed by means of Johnson's filter presses. We have no data to go upon in connection with works of the kind on this continent; and the computations of cost vary considerably in different places in England. Mr. Samuel W. Gray, City Engineer, of Providence, R.I., made very extensive and careful enquiries during a tour of investigation, and as a result states that the annual cost per head of population in England varies from 24 cents to 36 cents, and considers that a safe basis to go upon for America would be to compute the cost at about double of that in England. During the past few months, however, further experiments tend to bring the cost down to a lower figure.

If, from financial reasons, the city of Hamilton should not adopt this method of disposal, resort might be had to the plan of carrying the sewage out to a sufficient distance from the shores to prevent the accumulation of floating matter on the latter, and into a sufficient depth of water to obtain such a dilution of the sewage as will prevent its being in any sense a nuisance.

The depth of water should not be less than from 15 to 20 feet, and the distance from the shore not less than 2,000 feet. Should it be found that the head of water required to keep free from deposit a pipe of this length is not available pumping would have to be resorted to.

Provision would have to be made for allowing flood water (that produced by heavy rain storms)—to flow into the bay at the shore line.

All of which is respectfully submitted.

W. OLDRIGHT.
 D. GALBRAITH.

REPORT OF COMMITTEE ON SEWAGE, DRAINAGE AND WATER SUPPLY
 ON THE PROPOSED SYSTEM OF WATER SUPPLY FOR THE CITY
 OF BELLEVILLE.

To the Chairman and Members of the Provincial Board of Health :

GENTLEMEN.—Your Committee on Sewage, Drainage, and Water Supply, having been instructed to report on the proposed system of water supply for the City of Belleville, begs leave to report as follows :—

General Typographical Description.—Belleville, a city of about 12,000 inhabitants, is situated on the Bay of Quinte, about 12 miles from its western extremity or head. The Moira River runs through the city and empties into the bay at this point.

The Bay of Quinte might, without any impropriety, be called a river, its greatest width near its head being about $2\frac{1}{2}$ miles, its width opposite the western portion of

Belleville less than a mile, and at its eastern portion (by a sudden expansion) nearly two miles. The only considerable body of water emptying into the bay is the River Trent, a navigable river, on the mouth of which, about 10 miles west of Belleville, is situated the town of Trenton.

About half a mile outside the western limit of the city is the asylum for deaf mutes, the number of which varies say from 200 to 300; 293 being the number of pupils in 1883. This institution is provided with water closets, and the sewage empties into the bay.

The Moira is not a navigable river. From information furnished by the medical health officer and other officials its average width appears to be about 100 yards, its depth at low water not over a foot or eighteen inches, and its average rate during summer from four to five miles an hour.

Opposite the western portion of Belleville, and about 140 yards distant from it, is situated Zwick's Island, of an oval shape; its long diameter, parallel to the water front of the city at this point is a little over one-fourth of a mile long; at its north-eastern extremity, and stretching between it and the shore, is a swamp or reedy spot about three-eighths of a mile long and less than a quarter of a mile broad. This, we are informed, becomes dry, or almost dry, in time of low water.

The proposed system of water supply is to conduct the waters from a point nearly 300 yards south-west of this island, through a 20-inch iron pipe to a tank or well from which it is to be pumped, through mains and water services to be laid in the city. Between the end of the 20-inch intake pipe and the foot of the suction pipe to have a wooden frame, extending across the well and containing a filling about $2\frac{1}{2}$ inches thick of compressed sponges, through which the water must filter before it can enter the suction pipe of the pump. Plans and descriptions of this filter will be found attached to this report. This filter will be referred to more in detail at a later stage of the report. It is also proposed to have a water tower or stand-pipe 25 feet diameter and 120 feet high.

At the place selected near Zwick's Island from which to take the water, we are informed there are a number of springs, the water being colder in that locality. The depth of water at the proposed point of intake is about 20 feet.

The company is under obligation to furnish a water sufficiently pure for drinking purposes, and it is not compulsory on citizens to use the water unless they choose to do so. So that it is to the interest of the company to furnish good water. The company, we are informed, is the same which is supplying Cornwall with water.

Other possible sources of supply have been enquired for by your committee, and two others have been mentioned:—(1) Oak Hill pond, a distance say of 12 miles, the water of which is of extreme purity, but which is objectionable on account of expense and of doubts as to the quantity which it would yield. We are informed that in the dry season there is not enough water to run a mill which is placed upon its effluent stream. (2) Another source spoken of is Corby's Dam on the Moira River, but the water of this now is of a dark brown, swampy nature, and in summer might be deficient in quantity and at low elevation.

The present sources of supply are wells and local springs. The latter are deficient in quantity, and though the medical health officer is endeavoring to suppress, and is suppressing, the privy-pit system, nevertheless the condition is still such as to render the use of wells dangerous.

Character of the Water proposed to be Used.—A copy of the report of Dr. Ellis, who analyzed several specimens, will be found appended to this report. It will be seen that whilst he does not consider the water a first-class one, still it comes fairly within the class of "potable waters," its impurity being that of a "peaty water," not capable, *per se* of giving rise to any unhealthy condition.

Possible sources of sewage contamination were looked for and investigated. The town of Trenton contains about 5,000 inhabitants. The volume of water in the River Trent is such that no appreciable effect would be produced upon the water by the waste of this town. Nor has a sewage system been carried into effect. No evidence of sewage contamination, from the deaf mute institute, of the water at the proposed

point of intake has been presented to us ; but we consider that it would be a proper course to utilize the sewage of the institution on the farm attached to it.

In regard to the sewage system of Belleville itself, which must soon follow the introduction of water works, there will be ample facility for disposing of the sewage at a sufficient distance below the point of water intake, and without danger of return currents. We have made all necessary enquiries about currents, as will be seen in a copy of a letter addressed by your committee to Dr. Tracy, medical health officer, and of his replies thereto.

The filters proposed will be understood by a reference to the plans and designs sent by the Medical Health Officer.

The proposers do not refer us to any instances of their use in other places, so that they seem to be of the nature of an experiment, and one that we cannot endorse. We fear that so much trouble will be required for a frequent and efficient cleansing of them, that this will seldom be attained. And we would remind the Board of the acknowledged fact (which is almost a truism), that a filter which cannot be kept clean tends rather to pollute than purify the water passing through it.

A proper system of filtration must be employed with a water such as that described as being obtainable. Even if a filter acting by gravity and consisting of successive horizontal layers of sand and other filtering material were to be recommended, on general principles, it could not be adopted here without a second system of pumping, and other engineering difficulties. The system of mechanical filtration, with proper facilities for frequent and efficient cleansing of the filtering material, seems to be that most appreciated by sanitarians on this Continent at least at the present time. Regarding the Hyatt filters of the Newark Filtering Co., we have received such information from various sources as would lead us to believe that they are well adapted for the indications set forth above. The information referred to may be stated as follows :—

(1) The filtration of the water supplied to the Asylum for the Insane at Kingston having become a necessity, Dr. W. T. O'Reilly, Inspector of Asylums, made a personal inspection and investigation of the work done by the Hyatt filter in various places, and was so pleased with the result that he recommended one for the Kingston Asylum.

(2) Two of the members of your Board, one of whom is a member of this Committee, saw this filter in operation, and saw the process of washing the filtering material ; the filthiness of the water in which the sand was washed was not less striking than the contrast between the filtered and unfiltered water. We are informed by Dr. O'Reilly that the filter, which has been in use nearly three years, continues to give great satisfaction. The filtering material is washed daily, and could, if necessary, be washed oftener, one man being sufficient to attend to the operation.

(3) Very satisfactory reports are published by the Newark Company from cities on the Mississippi and in other parts of the United States, where they are used for removing the suspended impurities of very turbid waters.

(4) The reports from various sources have been so satisfactory that the United States authorities are now contemplating the use of this system of filtration on a very large scale for the City of Washington. The report of Capt. Thos. W. Seymons, Captain of the Corps of Engineers, U.S.A., is herewith laid before the Board.

The Recommendation of your Committee then, is that the Board approve of the proposal to obtain the water supply of Belleville from the Bay of Quinte, at the spot selected and indicated to your Committee, provided that some efficient system of filtration is adopted.

Your Committee desires to express its obligation to Dr. W. T. O'Reilly and Robert Christie, Esq., for information supplied by them.

All of which is respectfully submitted.

WM. OLDRIGHT.
J. GALBRAITH.

Toronto, 23rd May, 1887.

5* (B.H.)

REPORT *RE* NIAGARA FALLS SEWER DISPUTE.

To the Chairman and Members of the Provincial Board of Health :

GENTLEMEN,—This day, in company with Dr. Bryce, secretary to the Provincial Board of Health, I proceeded to the town of Niagara Falls, and after ascertaining the course of a stream which runs through the town, and is in great part covered and used as a sewer, we visited together the locality regarding which it has been reported to the Board of Health that a dispute existed between the corporation of the town and Dr. John Ferguson, M.P.

Entering the grounds of Dr. Ferguson for a few yards, a newly constructed drain was come upon, which being followed to the left, led to a stone culvert, near which the drain ended, without communicating with the culvert. The culvert proved to be the outlet of the drainage of the town.

The contents of the culvert were in a great measure discharged into an open stream which passed towards the river along the base of a slight elevation, on which stands the dwelling house of Dr. Ferguson, and through his orchard. A small portion of the foul water from the culvert was turned aside into a wooden box, nine inches square, and was conveyed to the river's edge for the purpose of supplying power to an elevator there.

The open stream, containing much the greater part of the drainage from the culvert, and passing within a short distance of the front of the dwelling, is offensive to sight and smell, is a nuisance, and a source of danger to those who live near it—the water is foul, and the bottom covered everywhere with sewer deposit—"sludge." The sewer, so-called, of Niagara Falls, in reality is a natural watercourse, which has been confined and covered over, as it passes through the town, and thus perverted to its present use.

It seems right, as it is quite possible, that the corporation of the town should intercept all the sewage before it reach the watercourse, and that this no longer remain a source of molestation and danger to those whose places of abode it passes by.

The following additional particulars may be given with regard to the matter. The questions at issue, as will be remembered were: 1st. Inasmuch as part of the water of this water-course, used as a public sewer, was turned aside for working an elevator, from which it was stated Dr. Ferguson received a revenue, whether the doctor could fairly ask the town of Niagara Falls to pay the expense of carrying the remainder of the water to the Niagara River by a sewer constructed through his property—within the town; since it was asserted that had no water been diverted from its natural channel, no deposit would have occurred on his property along the course of the creek.

2nd. Whether, inasmuch as the construction of the sewer was undertaken by the authority of the Local Board, their order on the treasurer was legally sufficient to order that the municipality pay the cost of the work.

3rd. Whether it was legal for a municipality to create a nuisance on private property by allowing an open water-course to become an open sewer on private property, thereby creating what was on all hands acknowledged to be a nuisance.

The summary of facts as above stated shows, viz., that a nuisance could not fail of being created under the circumstances; and it is interesting in view of the bearing of the question upon the powers of Local Boards to state how the matter has been concluded.

1st. It has been stated that the Board built an 18-inch tile sewer, and that it then sent the accounts to the Council for payment.

2nd. That the Council refused to honour the accounts.

3rd. That the Board refused to connect the new sewer with the old one until such work was paid for.

4th. That the town solicitor could find no reason why the Council should be required to pay it.

5th. That this Board was appealed to formally to have the nuisance abated on Dr. Ferguson's property.

6th. That before the formal investigation by your committee, Dr. Ferguson had had an injunction issued, preventing the town from creating a nuisance by pouring the town sewage into a natural water-course on his property.

7th. That the Town Council suddenly found that it would be perfectly legal for them to acknowledge the responsibility of the municipality for the payment of work ordered by the Local Board of Health.

It is to be hoped that Local Boards generally will recognize the importance of the decision as far as relates to their power to order work to be done, in performing their duties under the Health Act, and to have their accounts honoured by the treasurer of the municipality.

All of which is respectfully submitted.

J. D. MACDONALD.
PETER H. BRYCE.

REPORT OF THE SECRETARY *RE* BERLIN AND BRANTFORD WATERWORKS.

To the Chairman and Members of the Public Board of Health:

GENTLEMEN,—Having, as will be observed from the correspondence, been requested to report on several matters connected with the various towns mentioned, I have, in the absence of any committee appointed to deal specially with the matters of sewerage and public water supplies, made visits of inspection to Brantford and Berlin, in order that any contracts or agreements made may be executed as soon as possible.

Dealing with these places in the order of my visits I first refer to the city of Brantford.

Brantford.—On a telegram stating that Mr. Haskins, engineer, of Hamilton, the Local Board of Health and members of the Council were to visit Blue Lake, I left for Brantford on Wednesday, but, unfortunately, I was a day too late to go with the party. The opinion of the whole party, after a close inspection of the lake, its surroundings, and the hill country through which pipes would have to be laid, was, I understand, unanimously against any further consideration of supplying Brantford from this source, some nine miles away.

The soil about Brantford being of a sand and gravel loam with a clay sub-stratum, makes it of great importance that in so large a centre of population wells be done away with; and the Mayor, Medical Health Officer, Council, and Local Board of Health are all busily engaged in discussing which of several schemes will be best for the city.

The Medical Health Officer and myself on the day of my visit made a thorough inspection of the river valley to the west of the city. The river valley varies from one to two miles in width, with considerable flats of a gravelly loam, often flooded in the spring time. The river water is good, but receives the drainage of a number of towns, Paris, Ayr, Galt, etc.

Two schemes since my visit have, through the activity of the citizens' representatives, been presented for consideration. As both have qualities, making them valuable under different conditions, and as Brantford has not presented any scheme to this Board for its formal approval, I deem it well to say nothing more than that one scheme, is that of the drive well, or gang well system, by which the water will be taken deep down from strata to which the ground waters have filtered; while the other provides for the utilization of river water after allowing it to filter through a bed of sand before entering the pumping well. It is proposed that the plant of the present partial system,

by which water for fire purposes is supplied to the town from a spring creek, be bought and become a part of any new system.

There is under contemplation a system of sewerage for the town, and an examination of the canal of the flats below the city, and of the river channel, was made by the Medical Health Officer and myself with a view to the selection of the best site for their outfall sewer.

The city has instituted a system of licenses for milk vendors, and carries on a periodical inspection of all dairies and cow sheds, both within and without the city, from which milk is supplied to the city.

Berlin.—I herewith submit for the consideration of the Board the plans and specifications, with the form of contract made between "The Berlin Waterworks Company and the Town of Berlin."

In order to facilitate the progress of the scheme for supplying Berlin with water, I requested the contractors and the Mayor of Berlin to forward the plans and specifications, so that they could be considered at this meeting, and visited the town on the 15th of August and inspected the proposed source of supply.

As stated in the contract, the company propose obtaining the supply from springs or from Shoemakers' Lake.

For the information of the Board I would say that the high lands of that portion of the Province are composed of sand and gravel loam, sometimes overlying beds of clay, and in the valleys as at Guelph, the rock crops out. The ground around Shoemaker's lake has these first characteristics. It is on a considerable expanse of rising ground, declining on two or three sides, and supplying on the west and south drainage into Shoemaker's creek, and gives enough of water in such a season as this to run a saw mill. To the eastward the high ground declines, and from springs on the hills supplies most of the water which makes Shoemaker's lake.

The lake, I am informed, never changes its level, has not this year, and personal evidence went to show that several springs on the hill side are never ceasing in their flow.

The pumping wells are to be sunk near the lake, but as will be seen from the rough sketch as many more wells can be sunk along the declivity as are required to give sufficient supply of spring water to the town.

As will be seen from the agreement, a sufficient supply of first-class water is guaranteed, and must be to the satisfaction of the Local Board at all times in the matter of purity.

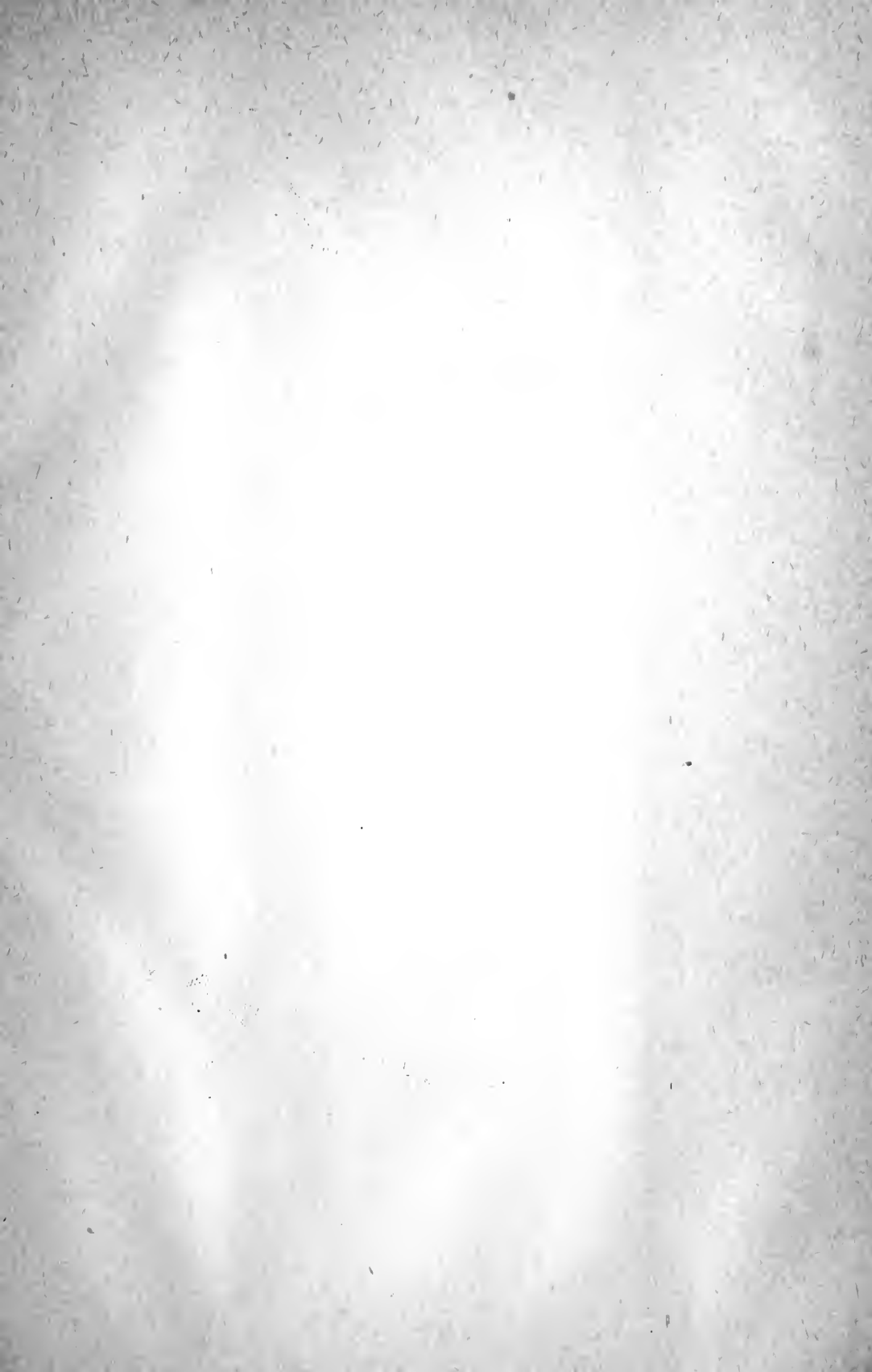
There can be no question regarding the purity of the water of these springs at present, and as regards their future I think there can be no doubt that should the uplands be maintained in pasture, meadow lands, or even occasionally manured, filtration and oxidation before reaching the springs, would make any danger from this source of no practical account.

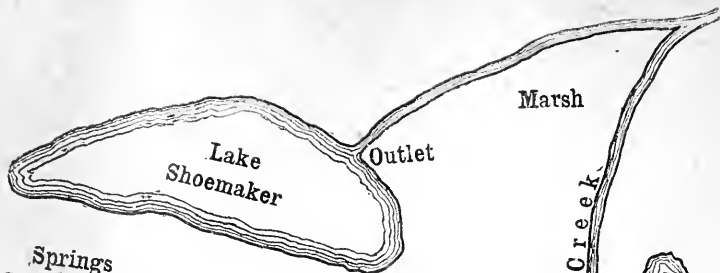
I would therefore recommend that the Board, by resolution, approve of the scheme for supplying water to the town of Berlin.

I also visited a creek at a point some considerable distance below a tannery, which has been complained of as a nuisance, on account of the pollution of said creek by the washings, clippings of hides, etc., which are thrown into it. The stream being practically dry at the time of my visit, I had no fair opportunity of judging whether the matter is one of such import as to demand further consideration by this Board. I understand legal proceedings have been taken by interested parties with the intention of preventing the further pollution of the stream by the tannery proprietors.

All of which is respectfully submitted,

P. H. BRYCE,
Secretary.





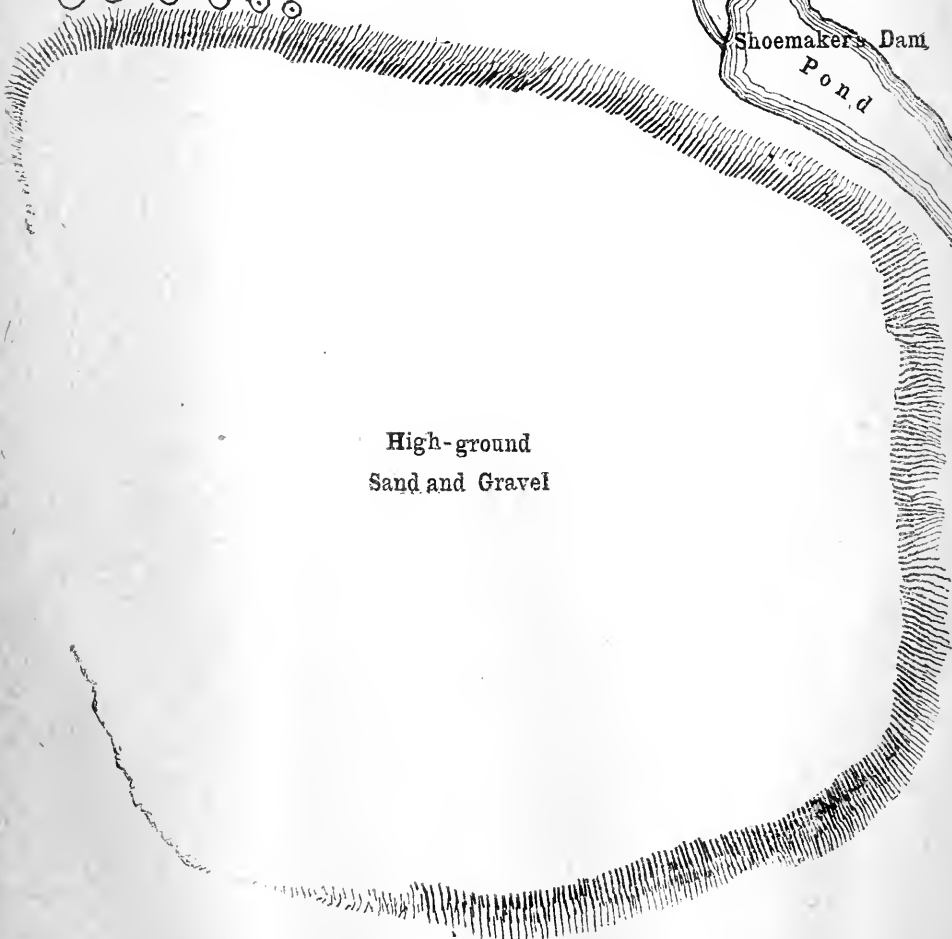
Springs



Shoemaker's Dam
Pond



High-ground
Sand and Gravel



REPORT *RE* THE WOODVALE POND, ST. GEORGE.

To the Chairman and Members of the Provincial Board :

GENTLEMEN,—Your Committee on Sewerage and Water Supply, visited the village of St. George, on Thursday, the 8th ultimo, and, having met in the village immediately, without communicating with the parties involved in the dispute regarding the matter complained of, proceeded to examine the pond of which complaints had been made to the Board.

The pond is situated about a quarter of a mile to the south of St. George, on the road to the Grand Trunk station, the road forming the dam or dyke by which the water is retained. The pond so formed is about an acre and a half in extent, and is of considerable depth, apparently from six to eight feet deep in some of its parts. The water contained in it is clear.

The banks at the end next the road are tolerably high; further back the margin is formed by a field which is cultivated to the water's edge, and at the extremity farther off there is an enclosed space of about a quarter of an acre, through which flows, in a rapid current, the waters of supply to the pond. This little stream is about three feet broad, and upwards of two feet deep. The fenced portion through which it runs is a little swampy, but is covered with long grass, on which horses were grazing. The margin towards the south and east is fringed with oak and basswood trees.

There are in the water several decaying logs or trees, apparently lying where they fell, and other timber, as old fence rails and small pieces of broken boards. Over the surface are several patches of what is commonly called slime, but which is living vegetation rooted to the bottom; throughout there is abundance of pond weed: in the shallower parts are clumps of rushes, and round the edges an iris or two.

Not far from the edges of the ravine—called Woodvale—in which the pond lies, are four houses. Of those the nearest is that of the occupant of the mill, to turn which the water is used. This house lies across a green field, about 150 paces from the pond bank, which is here about six feet high. The other houses are not only at a greater distance but at a higher elevation. On enquiring as to the sickness which might exist in those houses, the information obtained was, that the family in one of them suffered a good deal, but from sickness of various kinds, and not of malarial origin, and that its members had been equally delicate before moving into the house inhabited by them at present. There are three ponds in or near St. George, all formed by the obstruction of the same stream in its course towards Woodvale. One of those is in or near the middle of the village, immediately behind the premises of Dr. Kitchen, Sen. The second is at the foot of the main street, both free from floating material; and the third is the one complained of. The industries and the existence of the village seem to depend upon its ponds; and therefore the propriety of drying those is questionable; and further, your Committee, after examination and enquiry, cannot see that sanitary considerations render this expedient necessary. No complaints have been made of the two upper ponds. Your Committee would recommend that the logs, wood and other decaying matter be removed from the water complained of as being in a state dangerous to health, and that care be taken that the muddy bottom be not left exposed. It should not be difficult to succeed in this precaution, as the rush of the stream of supply seems sufficient, under good arrangements, to drive very heavy machinery.

Respectfully submitted,

J. D. MACDONALD, M.D.

H. M. MACKAY, M.D.

REPORT OF COMMITTEE ON FOODS AND ADULTERATIONS, RE INSPECTION OF PUBLIC MILK SUPPLIES.

Your Committee on foods and adulterations begs leave to report as follows :

GENTLEMEN,—The question of inspection of milk supplies to cities has been so frequently brought to the attention of this Board, in regard to its necessity, that but little need be said on this point. Past and recent legislation have placed Local and Provincial Boards of Health in a position to deal strongly with this matter of signal importance.

In a few cities and towns of Ontario an inspection (by the Food Inspectors of milk supplies) has been in existence for years; but their energies have generally been directed to examining samples of milk as to adulteration or watering, and occasionally, when the byres have been in towns, their conduct and cleanliness have been matters examined by Sanitary Inspectors. In several cities, notably Brantford and Windsor, an attempt has been made, by licensing milk vendors, to cause them to submit to an inspection of their premises; but, excepting these, there has, as far as I am aware of, been no attempt to guard against the contamination of milk, or its production by unhealthy cows. From abundant evidence, received from every source, it is quite plain that tuberculous cows are frequently utilized for supplying public milk, persons coming from houses wherein are infectious diseases, both milk the cows, carry the milk to shops, and the milk vendors on the streets have been known in many instances to come from houses with the infectious diseases; also, to handle the cloths, etc., which are used to wash the cans. Waters contaminated with typhoid germs, etc., have been known to be used in washing dishes, while the cans and pans have been exposed to sewer gas, from bad house drains. When taken in connection with this it is known that the waste refuse products from corn starch factories, from silos containing fermenting cut green corn, and probably distillery slops, have, notably in the summer season, been charged, with reason, of causing gastric disturbances and diarrhoeas, there can be no doubt but that the duty of Health Boards to deal practically with these matters is beyond question.

The question of what this Board ought to do is now a matter for consideration.

Your Committee considers that the increased powers placed upon this Board leaves no option to it, but that of taking action, if it believes these statements to be true in relation to the outbreaks of many epidemics of disease, as shown in the reports of the Local Government Board, Great Britain, *re* outbreaks of scarlet fever, as that at Hendon, published in 1887, and of diphtheria at York Town and Cantberry District, recently published.

Your Committee, taking into consideration the position the Board now legally occupies, would recommend—

1st. That all Local Boards be reminded by circular what their duties are in relation to the inspection of milk, stables, animals, etc., and that the points be indicated which ought to be examined into by them.

2nd. And that their attention be called to the duty laid upon this Board of taking such action as it deems necessary for limiting the spread of filth diseases; and farther, that Local Boards be requested to take such effective measures in matters laid upon them by the Acts, as will make it unnecessary for this Board to interfere actively in matters ordinarily carried out by local boards.

FRANCIS RAE.

To the Honourable Alexander M. Ross, Provincial Treasurer and Commissioner of Agriculture of Ontario.

SIR,—It will be present to your recollection, that a series of reports have been presented to and adopted by the Provincial Board of Health during the last two years in consequence of the numerous complaints presented to the Board regarding cheese

factories, creameries and dairies, owing to the unsanitary methods for the disposal of whey and other waste products connected with them; further that a conjoint committee of the Provincial Board of Health and Western Ontario Dairymen's Association adopted certain recommendations regarding the construction and management of cheese factories, the method of supplying milk to these factories, as well as the methods for the proper disposal of whey and other refuse products. It may be further stated that the committee appointed to deal with the subject in concluding recommended:—

1. "That an inspector or inspectors be appointed under the Minister of the Department, which inspector should have power to inspect nuisances and unsanitary conditions existing in and around cheese factories and creameries, and to report to the Minister.

2. "That they assist under the direction of the Minister of Agriculture in carrying out recommendations and suggestions similar to those made by the Western Ontario Dairymen's Association in regard to—(a) construction and management of cheese factories, creameries and hog pens, and (b) disposal of whey and the providing of milk.

3. "That your committee be further empowered and directed to act with the committee of the Dairymen's Association to secure such legislation as is necessary to carry out these suggestions."

During the year 1886 the Board further urged the necessity of such inspections of food by referring at different times to the evils existing in connection with public meat supplies. The Board's recommendation regarding new legislation is contained in the provisions incorporated in secs. 4 and 5 of "An Act to amend the Act respecting Public Health," passed in 1887, which requires the periodic and systematic inspection of such sources of meat supplies by municipalities, whether within or without the municipality, but the similar authority of a Local Health Board with reference to milk supplies has been inadvertently apparently "limited to its own municipality." The Provincial Board would respectfully submit that the inspection of milk at the source of supply is absolutely essential to any effective system of preventing or lessening the many dangers both as regards the supply of milk from unhealthy animals and the subsequent contamination of healthy milk. To show that these latter dangers are of the most positive character this Board would respectfully submit the following facts:—

1. That milk is in a special sense a "culture" medium for bacteria of many kinds, and that, as every one knows, it does undergo lactic acid fermentation often during a single night. A common estimate of biologists is that a single bacterium by a process of growth and subdivision may give rise to more than $16\frac{1}{2}$ millions of similar organisms in 24 hours, so minute that the whole number would occupy a space less than 1-1600th of a cubic inch, and it has been practically demonstrated by T. M. Prudden, M.D., Director of the Laboratory of the College of Physicians and Surgeons, New York, that, more than one and a half millions of typhoid bacteria may be diffused in a teaspoonful of clear distilled water without in the least appreciable degree altering its transparency.

2. That while the great proportion of bacteria are harmless, playing the part of breaking down organized bodies into their simpler constituents, nevertheless there are some bacteria, as bacilli of typhoid, bacilli of diphtheria, bacilli of scarlatina, of pyæmia, tuberculosis, etc., which have undoubted disease-producing characters.

3. Koch, Fraenckel, Frankland, Prudden and all high authorities on water analysis are agreed in saying that good drinking water ought not to show more than 50 living bacteria per cubic centimetre; but when it has been shown that clear ice which seemed apparently good, from a river receiving sewage from a city some miles above, contained as many as 50,000 living bacteria per cubic centimetre (20 drops) when the ice was melted down, it will not be difficult to see how enormously the dangers to life from such organisms are increased where a cultured medium like milk is contaminated, (a) by the microbes of a disease from the blood of a tuberculous cow, from cows drinking sewage-polluted water, or from breathing the air on the farms, the atmosphere of which is contaminated by the emanations from the decomposing bodies of dead animals, (some

factories by by-law prohibit the reception of milk from farms whereon are dead animals); (b) by direct pollution of the milk in cans containing remains of decomposed milk, or washed with sewage-contaminated water, as from the barnyard pump or from dirty cloths used in washing; (c) by direct pollution of the milk in milking from the hands of persons coming from houses where these infectious diseases are; (d) in the dirty waggons wherein manures, etc., are sometimes carted home from the city piled up against the milk cans, or (e) by infection from the air in milk sheds and shops in the city where milk is kept over from night till morning and by the putting into the cans uncleansed utensils for the purpose of taking out small lots for sale during the evening.

4. That these causes are of daily occurrence is evidenced by such investigations as those of the Local Government Board of Great Britain, the reports of the Veterinary Inspector and the Analytical Chemist of the City of Brooklyn, 1886, or the practical experience of many of our cheese and butter makers *re* milk not subjected to a tithe of the dangers to which ordinary city milk is exposed. If statistics of our Ontario cities cannot give us any very positive evidence regarding these dangers it is only because no such organized systems of inspection and examination are in existence to follow out the minute details of any so scientific a subject.

5. Viewing these facts from the standpoint of your Board appointed especially to deal with these matters, it must be evident to you that the recommendations of its Committee on foods, drinks, and adulterations on this subject would seem to be urgently called for, and that practical effect be given to their recommendations seems equally plain.

As you are doubtless aware Schedule A., Public Health Act, 1884 (liable, however, to repeal by Council), gives power to municipalities to grant licenses to milk vendors, to inspect byres, animals, etc.; and that the statute of 1887 gives a similar power has been already stated. What further seems to be required, however, is that instructions be transmitted to your Board authorizing it to recommend to the Local Boards a system of public milk inspection particularly in our larger centres of population in view of the existing and yearly increasing prevalence of such diseases as diphtheria, tuberculosis, etc., and to authorize your Board to further to state that under the powers given it under clause 6 of the statute of 1887 it will be the duty of the Provincial, where said Local Boards fail, to carry out these suggestions, that such inspections should be made at the expense of said municipalities, should it be so ordered.

This memorial was unanimously adopted by the Board on motion of Dr. F. Rae, seconded by Dr. P. H. Bryce and ordered to be transmitted to the Minister of the Department.

FRANCIS RAE,
Chairman.

TORONTO, 24th August, 1887.

DR. P. H. BRYCE,
Secretary Provincial Board of Health, Toronto.

SIR,—Referring to the memorial or recommendation of the Provincial Board of Health adopted at the last meeting of the Board, in regard to the inspection of cheese factories and creameries, I would say:—

1st. In regard to the recommendation “that an inspector or inspectors be appointed under the Minister of the Department, which inspector should have power to inspect nuisances and unsanitary conditions existing in and around cheese factories and report to the Minister” that section 5 of the Public Health Act of 1887 authorizes a medical officer, under the direction of the Local Board, to make an inspection of dairies, creameries, cheese factories, etc., within his jurisdiction; but there is no Legislative authority for the appointment of a Provincial inspector or inspectors acting under the Minister.

2nd. In regard to the request in the last paragraph of the memorial, “that instructions be transmitted to the Board authorizing it to recommend to the Local Boards a

system of public milk inspection, particularly in our larger centres of population in view of the existing and yearly increasing prevalence of such diseases as diphtheria, tuberculosis, etc., and to authorize your Board to further state that under the powers given it under clause 6 of the statute of 1887, it will be the duty of the Provincial, where said Local Board fail, to carry out these suggestions, and that such inspection should be made at the expense of such municipalities, should it be so ordered."

By the Public Health Acts, Municipal Councils are given full control of the licensing, regulation and inspecting of these dairies and factories, and in view of the dangers arising from the unsanitary conditions of milk, set forth in your memorial, I shall be happy to concur in the Provincial Board making any recommendation to the Councils and Local Boards which they think essential, in regard to a system of inspection of such by the Medical Health Officer, or as otherwise directed by the local Board ; but I cannot authorize the Provincial Board to state, under the powers given in section 6 of the statute of 1887, it will be the duty of the Provincial Board, where such Local Boards fail, to carry out the suggestions at the expense of the municipality, as I do not conceive that section 6 gives the Provincial Board or myself any such authority in such matters. The powers extended to the Provincial Board and to the Minister of the Department by this section are expressly confined to measures to be taken for the limitation of "any *existing*, dangerous, contagious or infectious disease."

I am, Sir, your obedient servant,

A. M. ROSS,
Commissioner.

TORONTO, November 30th, 1887.

Your Committee on Epidemics begs leave to report that it held, as directed, an interview with the Minister *re* the importance of inspection of milk supplies in those places where diphtheria or other communicable disease exists. The Minister, while insisting strongly on the desirability of local authorities performing their own work as required by the Health Acts, is of opinion that this Board is empowered by section 6, 1887, to require such measures to be taken by Local Boards where there seems to be danger of such diseases being introduced from milk supplies. It, therefore, remains for this Board to decide whether the condensed report regarding the existing prevalence of diphtheria and typhoid does not present such facts as to make it proper for the Board to insist upon regulation and inspection in such municipalities as having said diseases prevailing.

All of which is respectfully submitted.

FRANCIS RAE.
P. H. BRYCE.

REPORT OF COMMITTEE ON VENTILATION.

MR. CHAIRMAN AND GENTLEMEN,—We have great satisfaction in submitting for your approval Dr. R. Blockmann's apparatus for determining the proportion of carbon dioxide in a given sample of air. It possesses the merit of giving quantitative results, and of being so simple in its action that no chemical knowledge is required in order to use it ; it is also very cheap. The process is based on the employment of a sufficient volume of the air under trial to saturate, by means of the carbon dioxide gas present in it, a given amount of lime water of a *fixed strength*. In order to recognize the fact of this saturation a few drops of a solution of phenolphthalein are added to the lime water until it assumes a visibly red tint. The colour remains as long as the liquid continues alkaline, but directly the caustic lime is all converted into the carbonate, a very small excess of carbon dioxide is sufficient entirely to destroy all trace of the red tint.

The apparatus consists of a glass bottle of the capacity of 500 c. c., or half a litre ; a bent glass tube with a bulbous expansion near the middle, which makes it fit accurately over the neck of the bottle, a solution of phenolphthalein made with rectified spirit, and a solution of lime water, which is one-tenth the strength of the volumetric solution. The mode of using the apparatus is as follows* :—

The bottle is filled with the air to be tested by sucking out the air contained in it through the bent glass tube ; half an ounce of lime water is poured into the bottle together with three drops of the solution of phenolphthalein, and the bottle is then corked and shaken for three or four minutes ; if the liquid is still red, the bottle is filled a second time with air, corked and shaken as before, and the process is repeated until the colour in the liquid vanishes. If the colour remains for four fillings, the air is very good, as pure as the outside air ; if it remains for three fillings, it is a good sample of indoor air ; if it disappears at the second filling, it is not good air ; if the colour goes at the first filling, the air is so impure as to render it wholly unfit to be breathed. A table follows in which the volumes of carbon dioxide gas present in 1,000 volumes of air are given as indicated by each filling from the first to the fourth. Thus, taking half an ounce of lime water :—

1st filling.....	1.61 per mille.
2nd “ .....	.806 “
3rd “ .....	.537 “
4th “	400 at 60 Fahr.

By increasing the quantity of lime water the presence of much larger quantities of the gas can be ascertained ; thus, with one ounce of lime water, a discoloration at the first filling would indicate the existence of 3.22 vols. per mille.

Mr. Heys, analytical chemist, of 116 King St. West, has examined the Blockmann method, and reports, “That in his opinion it gives excellent approximative results sufficiently accurate for practical purposes.”

All of which is respectfully submitted.

J. J. CASSIDY.

H. P. YEOMANS.

REPORT OF COMMITTEE ON POISONS.

To the Chairman and Members of the Provincial Board of Health :

GENTLEMEN,—At the last regular meeting of this board, instructions were given to your committee on poisons and accidents to report at this meeting on the best means of preventing loss of life from the inhalation of illuminating gas in bedrooms. Your committee having carefully looked into the matter, beg to report as follows :—

Accidents of the kind mentioned rarely occur in private dwellings. Unfortunately, however, they are not infrequent in hotels. Any remarks or suggestions which will be made in this report will therefore apply more particularly to the latter.

To any person who will give the subject a few moments thought, the prevention of these accidents will not seem a difficult task. And yet, however, though the necessity for taking some appropriate action in this direction seems patent to all definite rules and instructions calculated, if observed, to prevent loss of life, have so far not been made binding on hotel-keepers and other interested and responsible parties.

Your committee propose therefore to lay before you, for your consideration, certain rules, the observance of which, in their opinion, will entirely prevent loss of life from the inhalation of illuminating gas in bedrooms, and yet not entail any hardship on the

*The apparatus and the solutions mentioned may be obtained at 116 King Street, West, Toronto.

hotel-keepers. At the same time, if the rules are not observed, and a fatal accident should occur, the coroner will be enabled, in the exercise of his duty, to show where the responsibility rests.

(1). Iron gratings, 12x12, should be inserted in the walls above bedroom doors. Fanlights, which are commonly used for the purpose of ventilating bedrooms, are considered by some to offer too great facilities to thieves or other improperly disposed persons. An iron grating, firmly bedded in the wall, would be free from this objection, and while helping in the general ventilation of the room, would enable the hotel officials to observe if gas was burning in the room or if it was escaping. In addition to this, where chimney flues do not communicate with bedrooms, special ventilating flues, reaching to the outer air, should in all cases be introduced.

(2). Whenever any kind of illuminating gas is used in a bedroom, a suitable automatic cut-off gas burner should be placed on every gas fixture. Dr. Henderson, of Winnipeg, has, as you are aware, exhibited to us a valuable invention of this kind, a description of which will be found at page 105 of the Annual Report of 1886. Your committee do not consider it necessary to describe several other inventions, more or less meritorious, which have been devised for the purpose of preventing accidents of the kind in question. Dr. Henderson's is clearly superior to any that we have seen or heard of, and is the only one which can be recommended to the public.

(3). The gas should never be turned off at the meter, except during the repair or refitting of the pipes.

(4). It ought to be the duty of some responsible person to move about the different flats of the building, during the night, at periods of two hours or oftener, in order to ascertain if gas is escaping.

(5). A periodical inspection of all gas fixtures, pipes and burners should be made by an inspector of plumbing, who should be appointed at the recommendation of the Local Board of Health.

Owing to the importance of the subject and the ease with which the recommendations here given could be carried into effect, your committee would suggest that representations be made to the Ontario Government, asking them to provide legislation which will enforce the provisions of this report.

All of which is respectfully submitted.

J. J. CASSIDY.
FRANCIS RAE.

REPORT OF THE SECRETARY *RE* INSPECTION OF NEW GROUNDS FOR CEMETERY AT BRADFORD.

To the Chairman and Members of the Provincial Board of Health:

GENTLEMEN—I have the honor to present my report of an inspection (made under Sec. 16. Chap. 7, Vic., 1887) of the various parcels of ground under consideration from which to select a site for a cemetery. This amendment of the Act respecting Cemetery Companies, Chap. 170, R. S. O., provides for the establishment of new cemeteries under certain conditions, stated therein in incorporated villages.

By arrangement, I visited Bradford on Aug. 4th, and met Dr. Taylor, Medical Health Officer, and various members of the Council and Local Board of Health. With them I visited the various proposed sites, and after inspection thereof and consultation with the aforesaid gentlemen, suggested that the most natural method of procedure would be for the Council and Local Board to meet and pass resolutions stating which site would best concur with their views and those of the villagers whom they represent, after which it

would be in order for them to inform this Board of their decisions, when, should no sanitary objections to the site selected by them be taken by this Board, their selection and purchase of any particular site would constitute a legal act.

This suggestion has been followed, and I have herewith attached the resolutions adopted by these two bodies. For reference read resolutions passed by the Council and Local Board of Health of Bradford:—

Moved by James Drifill, seconded by Robt. Bingham, that the lots owned by Thomas Drifill and James Goodchild and submitted by the Bradford Cemetery Co., for the approval of the Local Board of Health, are, in our opinion, suitable for use as a public cemetery.—Carried.

I hereby certify that the above is a correct copy of a resolution passed by the Local Board of Health of the Village of Bradford, this seventeenth day of August, 1887.

ROBT. STEWART.

Secy. Local Board of Health.

Bradford, 17th August, 1887.

From the resolutions it is apparent that there are two sites either of which, in their opinion, will be a satisfactory one for a cemetery. Inasmuch as both are, with the present size of the village, in my opinion practically free from any sanitary objections, it would seem to fulfil the duties laid upon this Board in the matter, if it were to adopt a report approving of the selection of either the Goodchild or Drifill plot. There are, however, several considerations which make it appear desirable that this Board should regard the powers which are given village corporations by this Act of Statutes of 1887, in the same spirit which caused the original Acts contained in the R. S. O. to be passed, which spirit is still further exemplified in Chap. 38, Stat. 1885, *re* the expropriation of land for public cemeteries.

In the latter Act it is provided that should any person object, from any cause, to the expropriation of his land for cemetery purposes, that arbitrators be then appointed to decide whether in their opinion it is necessary that such expropriation should be made, and if such be found necessary, that the price be thereafter fixed thereupon.

Private individuals are again protected by Sec. 3 of the same Act, which says that no land in city, town or village, within two hundred yards of any dwelling shall be expropriated without the consent of the owners thereof.

From these clauses, referring especially to the enlargement of existing cemeteries, (which enlargements, indeed, both from the standpoints of convenience and sentiment, are more reasonable than the establishment of new cemeteries in incorporated villages,) in which regard is had to objections which may be raised of a purely sentimental character, it seems to me that it would be, if not illegal, at least illogical, for this Board to be governed by one law in regard to the enlargement of existing cemeteries in villages, and by another in those cases where the question is one of establishing a new cemetery.

If this reasoning appear sound to the Board, it has then an easy task in selecting a lot. Mr. Goodchild's lot has a pleasant soil, and is a rising ground southward of the village, with drainage for the most part directly into the Holland River, and is, in every practical sense, outside the village. The Drifill property is also a beautiful plot, high, said to be dry, with a somewhat more tenacious soil, gently sloping toward the public road, which is lower than the plot under consideration. Drainage from it is along lower ground in the south-westerly part of the village, but cannot, I think, have any injurious effects on the village in its present extent.

Across the road from the Drifill plot are, however, two or three farm properties with houses within 200 yards of the front part of Mr. Drifill's plot. The following are the distances as forwarded to me by Dr. Taylor, Medical Health Officer:—From Drifill's field to Wm. Goodfellow's dwelling, 144 yards; from Drifill's field to Fennell's dwelling, 120 yards; from Drifill's field to Wm. Spence's house, 54 yards.

The Medical Health Officer has fully stated that two out of three of these parties have been seen, and they boldly object to having the cemetery on the Drifill plot.

Apart from the exceptions, which, it seems to me, can be fairly legally taken under Chap. 38, 1885, to the Drifill plot, there are no objections of a substantial character which I think can, from a sanitary standpoint, be taken to it.

I would recommend the adoption of the report with instructions that a copy of it be sent to the Bradford authorities. It will then be proper for the local authorities to come to a final selection with regard to the plot, having before them the various aspects from which the question may be viewed.

I have the honour to be

Your obedient servant,

PETER H. BRYCE,
Secretary.

Copy of resolution received subsequent to the report :

Moved by C. Dewson, seconded by C. Campbell, That the Bradford Cemetery Company, having submitted to this Council for its approval or otherwise, the following lots of land within the limits of this corporation as suitable sites to be used as a public cemetery, viz: the lot owned by Mr. Thos. Drifill, on Holland Street, and the lot owned by Mr. Jas. Goodchild, on Simcoe Street, (said lots having been examined by Dr. Bryce, Secy. Provincial Board of Health), are, in the opinion of this Council (either of them) suitable sites, from a sanitary point of view, for the purpose before mentioned.—Carried.

I hereby certify that the above written resolution is a correct copy of a resolution passed by the Council of the Corporation of the Village of Bradford, at a meeting held the 16th August, 1887.

ROBT. STEWART,
Town Clerk.

Bradford, 17th Aug., 1887.

REPORT OF THE DELEGATES TO THE INTERNATIONAL CONFERENCE OF STATE BOARDS OF HEALTH.

To the Members of the Board :

GENTLEMEN,—Your Committee appointed to attend the International Conference of State Boards and the International Medical Congress beg to report that they proceeded to Washington, arriving there on the 5th Sept., in time for the opening proceedings of the Medical Congress. The work of the sections began on the afternoon of the 5th, your committee devoting itself to the sections on Hygiene, Demography, and Climatology. The work of these sections was of a most interesting and practical character. The climatic relationships of disease were discussed at length, your secretary presenting a paper on "House Atmospheres." Dr. Dominguez Freire, of Brazil, presented an interesting and exhaustive paper on "Protective Inoculation Against Yellow Fever," giving statistics of results and microscopic demonstrations of the microbe.

The total number inoculated in 1885 and 1886 was.....	6,524
Total deaths after inoculation	8
Rate, one in	1,000

Deaths from fever amongst those not inoculated :—

Total deaths	1,667
Rate was ten in	1,000

In answer to questions, he stated his inoculations were made mostly in infected quarters, and in infected houses, and in these the inoculated had shown an immunity from the disease.

On Tuesday morning the preliminary meeting for organization of the State Board Conference was held. The roll of States was called, and reports of committees presented.

Amongst the subjects introduced was that *re* interstate notification of infective disease, by the committee of which your secretary is chairman. His report included a summary of the progress of the work during the year, and indicated its practical advantages in getting knowledge of outbreaks, and suggested points wherein the work was defective.

For the purpose of carrying out the views of different members of the Conference on the subject, a special committee was appointed to report at a subsequent session.

The following is a copy of the report introduced and subsequently adopted :

The National Conference of State Boards of Health, lately in session in Washington, adopted the following in regard to Inter-State Notification of Infectious Diseases, which was unanimously adopted by all the States and Provinces represented :—

REPORT TO THE INTERNATIONAL CONFERENCE OF STATE BOARDS, *re* NOTIFICATION OF INFECTIOUS DISEASES.

Your committee begs leave to report the following resolutions :—

Resolved,—First. That the Conference reaffirms the principles contained in the resolutions adopted by it at its meeting in Toronto, 1886.

Second. That those communicable diseases hereinafter mentioned, prevalent in certain areas, or which tend to spread along certain lines of travel, be reported to all State and Provincial Boards within said area or along said lines of communication.

Third. That in the instances of smallpox, cholera, yellow fever and typhus, reports be at once forwarded either by mail or telegraph, as the urgency of the case may demand ; and, further, that in the instance of diphtheria, scarlatina, typhoid fever, anthrax or glanders, weekly reports, where possible, be supplied, in which shall be indicated, as far as known, the places implicated and the degree of prevalence.

All of which is respectfully submitted.

PETER H. BRYCE,	} Committee.
HENRY B. BAKER,	
J. BERRIEN LINDSLEY,	
BENJ. LEE,	
J. T. REEVE,	
E. M. HUNT,	

The officers for the ensuing year are President, Dr. J. N. McCormack, Bowling Green, Ky., and Secretary, Dr. C. A. Lindsley, New Haven, Conn. It is earnestly hoped that local health officers will report at once by telegraph, telephone or mail, any cases of the disease mentioned in the resolutions to this office, so they may be reported to contiguous States. Thus by being promptly forwarded, States and localities may the more effectually ward off these diseases.

On the reports from States regarding health work during the year, there was a general evidence of advance in the appreciation by the people of the efforts of State and Local Boards in their behalf, and in the advance of health legislation. It may be fairly said, without fear of contradiction, that in no State or Province is health legislation more advanced than in Ontario, or the relations between Central and Local authorities so well defined or more harmonious.

After the work of the sections was over, a member of your committee spent a day in Philadelphia with Prof. Osler, of Pennsylvania University Medical College, and had an opportunity of examining with him the infusorial forms which can be demonstrated

in the blood of persons suffering from malaria. While these discoveries have somewhat lessened the growing belief in the existence of the *bacillus malarie*, still the capacity of such infusoria for development in human blood, and their probable growth external to the body under circumstances similar to those in which bacteria develop, indicate that whatever view may finally prevail, the prophylactic measures against malaria still remain the same.

Your committee, in concluding its report, cannot but express the feeling that the opportunities to mingle with men working out health problems under different phases and in different localities and climates, have a most stimulating influence upon those engaged in similar work at home, and further gives an opportunity for cultivating personal and friendly relations with men who at any moment may have to engage in a common work of fighting epidemic disease.

All of which is respectfully submitted.

FRANCOIS RAE,
P. H. BRYCE.

REPORT OF DELEGATES TO MEETING OF AMERICAN PUBLIC HEALTH ASSOCIATION, AT MEMPHIS, NOVEMBER. 1887.

To the Chairman and Members of the Provincial Board of Health.

GENTLEMEN,—As your delegate to the recent meeting of the American Public Health Association, I beg to present the following report, in which I have endeavoured to systematize the subjects treated of under certain heads:—

Maritime Quarantine and Disinfection.—I found that all sanitarians with whom I came in contact were eagerly interested in watching the course of events at New York, and the developments arising therefrom. The first public allusion to the subject in connection with this meeting, was the description of the President in his annual address, of his own experience on board a ship coming from Brazil where smallpox existed, which description I will give in his own words:—

“When I left Brazil in the month of August last, smallpox was epidemic both in Rio de Janeiro and at Para; our ship touched at Para and five days later at Barbadoes. A passenger for this port was not allowed to land, because of the prevalence of smallpox in Brazil. Proceeding to St. Thomas, less than two days' sail from Barbadoes, our passenger was again refused permission to land, except to go to the quarantine station for a certain number of days. This was all right, but the conditions upon which he would be received seemed to me to be all wrong. Either he himself or the ship must guarantee the payment of the quarantine fees, which would be \$3 a day for his board and \$5 a day to the quarantine physician if he were alone. If others were at the station at the same time this fee would be divided between them. One can easily imagine what a hardship such a tax would be for a person of limited means, who had only provided himself with funds for the journey he had undertaken. The agent of the ship refused to take any responsibility, and our passenger had no resource but to submit to the imposition or to come on to New York, paying his passage to that port.

“As another illustration of the evils arising from the present system of supporting quarantine establishments, I will mention a circumstance which occurred upon our arrival at the port of New York. With the deputy health officer who boarded our ship came a man with a jug. I was informed by one of the officers of the ship that he was to disinfect the vessel. Being somewhat curious to know the method of disinfection employed I asked the ship's surgeon to go with me to inspect, when, after a detention of less than one hour, we had started from the quarantine station for our wharf. We found that the man with the jug had lowered a bucket by means of a rope through

one of the hatches between decks. Upon pulling up this bucket I found that it contained two or three pounds of some powder which had been wet, probably with an acid solution, and which gave off an odor of chlorine. No doubt when first lowered between decks there had been a considerable evolution of chlorine, but in the vast space to be disinfected, it was so diluted that at the end of an hour I did not detect the odor of chlorine gas when I lifted the hatch, and it was only by approaching my nose to the bucket that I was able to ascertain what disinfectant had been used. The most curious part of the story is that I was informed that the bucket had been lowered between decks to disinfect a quantity of hides which were stored in the hold. What was the object of this "disinfection?" Evidently not to disinfect, for no one at the present day would think of maintaining that the hides in the hold had been disinfected by the procedure of the man with the jug.

"The only object that I can conceive of, depends upon the fact that there is a fee for disinfecting which must be paid by the agents of the ship; at least I was so informed by one of the officers of the ship.

"Gentlemen,—We cannot control the action of the sanitary authorities abroad, and if we are ever so unfortunate as to be thrown into a lazaretto in one of those countries, where the rights of the individual are counted as nothing, God pity us! for the fact that we are American citizens will be of no avail. But we can at least correct abuses, if such exist, at our own seaports, and set an example to other nations of an enlightened policy, which will not only redound to our credit, but will directly benefit our languishing commerce."

"On the following day the discussion of the proceedings at New York was opened by a paper on "Cholera and Quarantine," by Dr. Rauch, Secretary of the State Board of Illinois. In the course of his remarks he referred to the dangers of the present time, and gave a detailed account of the correspondence which he had carried on with Dr. Smith (the health officer), and with the quarantine commissioners of New York. The inference was that the New York officials had not been straightforward in the matter.

During the discussion most severe comments were passed on the outrageous deficiencies of New York for dealing with infection imported in vessels; and in these comments Dr. A. N. Bell, of New York, emphatically concurred. His only defence was that everything had gone to decay, and that Dr. Smith had done the best he could with the resources at his command. The description given by Dr. Bell of the method of disinfection, even after some improvements had been introduced, showed how insignificant and inadequate are the means of protection employed in the commercial metropolis of the North American Continent; the contents of a ship disinfected by steam, in what may be described as a good sized steam tight box formerly used by some private firm.

In compliance with the resolutions passed at the last meeting of your Board, I drew attention to, and made enquiry regarding, the reports referred to in those resolutions. Dr. Bell replied that the cases reported as measles were unmistakable cases of measles. I also enquired whether the agreement entered into by resolution at the Toronto meeting regarding inter-state notification of smallpox and cholera had been carried out by the various States and Provinces. Dr. McCormack, on behalf of the Convention of State Boards, said that the agreement had been carried out by all States except New York. I may here mention that I was informed by Dr. DeWolf, with whom I spent some time in Chicago, that he had been obliged to disinfect baggage of the passengers from off the Italian vessel, the "Independente," on account of its not having been disinfected at New York. It was stated by the New York authorities that the baggage of the immigrants had been disinfected; but, whilst Dr. DeWolf did not wish to make any discourteous contradiction, he was obliged to act, because the immigrants in question told him that their keys had never been out of their possession, and the locks, of a peculiar make, and the contents of boxes had evidently not been disturbed. At the meeting various remedies were suggested, many of them having to do with the relative parts which national, state and local authorities should take. Some of them

were of a more immediately practical character. Among the latter was the plan advocated in a vehement address by Dr. C. N. Hewitt, of Minnesota, that "the screws should be put on New York through the railroad lines," the latter to be informed that their trains would be side-tracked at the boundary lines of adjoining States unless lists and destinations of immigrants, and satisfactory proof of inspection and disinfection were furnished. The following resolution by Dr. McCormack, of Kentucky, modified by the Executive Committee, was adopted:—

"Whereas, This Association has heard with regret that after four years of warning, Asiatic cholera found the authorities at the port of New York very inadequately prepared to deal with it; and

"Whereas, The faithful administration of the quarantine regulations of all ports, and especially at the port of New York, is at this time of the highest importance to the whole country; therefore, be it

"Resolved, That the quarantine authorities of our maritime ports be urged to exercise the greatest possible caution in admitting ships from infected ports to free pratique.

"Resolved, That these quarantine authorities be requested to co-operate with State and Municipal Boards of Health in the effort to prevent the spread of contagious and infectious diseases from ports at which they may exist by furnishing to the health authorities of communities having relations with such ports, prompt information as to all real or suspected cases, and if immigrants, their destination and routes of travel."

I believe the discussion was extremely useful, and that the various inland States will not submit to any nonsense in connection with this matter, but will be prepared to take the necessary measures for their own protection, even as our own Province did not very long ago.

Before leaving this subject I must express my satisfaction, as a Canadian, at the admirable showing, (in contrast with the condition of affairs at New York) which Dr. Montizambert was able to make in regard to the Grosse Isle quarantine, and that the Dominion Government has been prevailed upon to issue more comprehensive and stringent regulations. I am informed, however, that the quarantine officers are exposed to considerable danger in rough weather, and I am glad to be further informed that some of the members of your Board are actively interested in aiding Dr. Montizambert in his efforts to have erected a deep water wharf for disinfecting purposes, such as exists at the mouth of the Mississippi. This establishment and its equipments were fully described in an excellent paper entitled, "Quarantine Defence of the Mississippi Valley," by our friend Dr. Joseph Holt, a copy of which is appended to this report.

It seems to be understood that the immense revenue derived from the quarantine fees at New York—computed at from \$70,000 to \$100,000—is diverted from its proper purpose of securing the physical health of the American community, and is so placed as to bolster up the political health (!) of a certain section of the free and independent.

Inland protection has already been referred to. I considered the time of the advent of cholera on our shores a most opportune season to draw attention to, and try to abolish, the dangerous practice explained in the following resolution, which was adopted:—

"That this Association would press upon the attention of railroad, national, state, provincial and local health authorities the absolute necessity of abolishing the present system of scattering the excreta along the railroad tracks, and of substituting therefor some method whereby the excreta can be completely and frequently removed from the trains and tracks, and safely and properly disposed of on sanitary principles."

I need not dilate upon the present spreading of typhoid fever (and the future dissemination of cholera, if it passes the boundary) by the infected excreta blown about in the dust of railroad beds, or dropped into streams from which drinking water may be obtained. Such contingencies are not pleasant in any case or at any time. I would ask your Board to support the action of your delegate by at once communicating with the railroad and other authorities in regard to this matter. It might be pointed out

to railroad magnates that it would be much easier to adopt a proper system gradually, now, than to make rapid and extensive alterations should the advent of an epidemic compel you to enforce your recommendations.

Disinfectants were again reported upon by the committee appointed for that purpose. Some further experiments in destruction of micro-organisms by heat were reported, and these were of an assuring nature.

The chloride of lime solution was recommended to be made one-half stronger (6 oz. to the gallon.)

Attention is directed in Dr. Sternberg's address to the differences in resisting power of different germs, and of the same kind of germs under different conditions. It is somewhat consoling to find in this connection that the lease of life of the cholera germ is less secure than that of the typhoid (for both these individuals seem to have had their existence and identity confirmed during the last year.)

Inasmuch as all the reports of the Committee on Disinfectants are to be "Consolidated" (after the manner of our Revised Statutes), I will not enter at greater length into the subject.

Regarding the vitality of germs, some very interesting observations are made, and one of these has such a very important bearing as throwing doubt upon the accuracy of a method of testing the wholesomeness of water supplies which has been recently brought into use, that I quote it from Dr. Sternberg's address:—

"A more recent research is that of Kraus, who employed well water and hydrant water from the city water-works of Munich, which, without being sterilized, was infected with pure cultures of various pathogenic organisms diluted with distilled water. The infected water was kept during the experiment at a temperature of $10\frac{1}{2}$ degrees C. Plate cultures were made from day to day. The results were as follows: The typhoid bacillus had disappeared by the seventh day, the cholera spirillum could not be found in plate cultures after the second day, the anthrax bacillus had disappeared at the end of four days; in the meantime the ordinary water organisms had increased enormously in number. From these experiments, considered in connection with those of Bolton and of Wolffhugel, Kraus concludes that the rapid destruction of pathogenic bacteria in non-sterilized water is a direct result of the action of ordinary water-organisms. If this be true it is evident that these water-bacteria are conservative from a sanitary point of view, and that the biological test of drinking water which gives the number of colonies which are obtained from a given quantity has no special value in the absence of an exact statement of the kind of bacteria and their pathogenic potency. The time has come when we must demand that those who undertake the biological examination of water with reference to its potability shall give some more definite information than that a certain number of colonies were found, some of which liquified gelatine and some did not. Up to the present time we have but few instances of the finding of known pathogenic bacteria in water used for drinking purposes. Koch found his spirillum in a water-tank in India, and several observers have reported the finding of the typhoid bacillus in drinking water. Recently Beumer examined the water of four wells in a vicinity where cases of typhoid fever had repeatedly occurred. From one of these wells colonies were obtained by the plate method which proved to have all the characters of the typhoid bacillus. The distinguished German chemist Brieger has succeeded in obtaining a toxic ptomaine from cultures of the typhoid bacillus which has the composition $C_7 H_{17} NO_2$.

The following theory of Dr. Sternberg regarding the etiology of pneumonia is also worthy of note:—

"Evidence is accumulating that a micrococcus which I have described under the name of *M. Pasteuri*, and which is found in normal human saliva, is far more frequently found in the exudate into the alveoli during the acute stage of croupous pneumonia than is that of Friedlander. I first experimented with this micrococcus in 1880, and isolated it in pure cultures in 1881, but it was not until January, 1885, that I discovered its presence in pneumonic sputum and made inoculations in rabbits with this material. . . . The constant presence of this micrococcus in the buccal secretions of healthy persons indicates that some other factor is required for the development of an attack of pneumonia; and it.

seems probable that this other factor acts by reducing the vital resisting power of the pulmonary tissues, and thus making them vulnerable to the attacks of the microbe. This supposition enables us to account for the development of the numerous cases of pneumonia which cannot be traced to infection from without. The germ being always present, auto-infection is liable to occur when from alcoholism, sewer-gas poisoning, crowd-poisoning or any other depressing agency the vitality of the tissues is reduced below the resisting point. We may suppose also that a reflex vasomotor paralysis, affecting a single lobe of the lung, for example, and induced by exposure to cold, may so reduce the resisting power of the pulmonary tissues as to permit this micrococcus to produce its characteristic effects.

"Again, we may suppose that a person, whose vital resisting power is reduced by any of the causes mentioned, may be attacked by pneumonia from external infection with material containing a pathogenic variety of this micrococcus having a tendency, permanent or acquired, greater than that possessed by the same organism in normal buccal secretions."

It is again gratifying to us as friends and fellow-countrymen of Professor Osler, to find him and Councilman of Baltimore credited with some "among the most important investigations of the past year," reference being made to their hunt after, and capture of the germ of malaria.

Protective Inoculation.—The Association has now entered upon another very interesting and useful field of labour. A committee has been appointed to make observations, as to the further protection of individuals from serious epidemic diseases.

The Separate System of Sewerage.—I had ample opportunity of inspecting, through the courtesy of Col. Merriwether, engineer of the "Taxing District of Shelby County" (better known to us as the City of Memphis), and of his assistant, Mr. Ross, the peculiarities of the system so well-known to you (the small gauged sewers of the system excluding all storm and rain water); hence I need only describe some points new to me, and possibly to you also.

In the first place, the six-inch pipes recommended and used for small street sewers are found to be a mistake: they often become obstructed; a carpenter's rule, with its six-inch joints, is said to be frequently found as the obstructing cause.

Secondly, manholes—for inspection purposes, are being introduced here and there on account of obstructions.

Thirdly, rain water is often introduced surreptitiously, and the engineer has been obliged to provide increased accommodation.

Fourthly, they cleanse the sewers periodically by means of a "pill" and brush. This was to me a new and interesting device. The pill is a hollow ball of thin metal—say galvanized iron or copper—made three inches less in diameter than the sewer to be cleansed. A staple is attached to its surface. To this staple the end of a rope is fastened and the ball is lowered into the sewer through an inspection hole. It then floats down the sewer and can be held or pulled back a little if any deposit is encountered; the fluid, in order to get away must scour under the ball through the small opening between it and the sewer; the velocity is thus increased and the bottom of the sewer scoured. When the ball reaches the next inspection hole below it is lifted out, and the rope may be dragged through and made the means of dragging after it a brush a little larger than the sewer and which has been attached to the upper end of the rope at the hole above.

The last peculiarity to which I will allude is that the water contains so much earthy matter that the flush tanks are no longer left to the automatic action of a trickle of water, but are filled by an employee and discharged once or twice a day.

I may be allowed to remind you that the overhead ventilation of sewers is the mode employed in Memphis.

Pullman Sewage Farm.—Through the kindness of Dr. DeWolf I received a permit to visit the extensive car works of the City of Pullman, whither I was escorted by Mr. Genung, (a gentleman in charge of one of the departments of Dr. DeWolf's office), and accompanied by Mr. G. H. Allen, of the *Sanitary News*. We were kindly conducted through the workshops, sewage pumping house, water tower, and shown the various other points of interest in Pullman City by Mr. Duane Doty, civil engineer. On the following day I went out to the sewage farm, three miles east of Pullman City, and was courteously driven over it by Mr. E. F. Martin, farm superintendent.

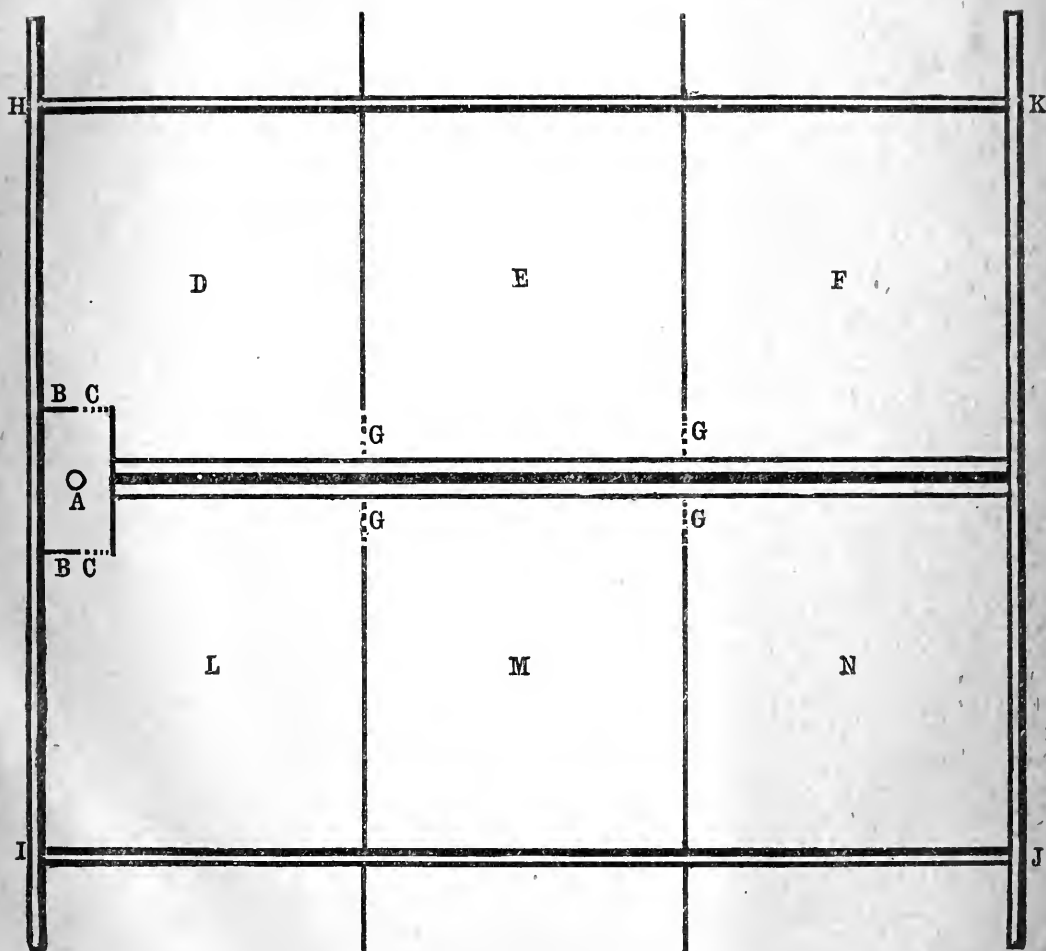
The City of Pullman is sewered on the separate system. The sewerage mains discharge 16 feet below the surface of the ground into a reservoir under the water tower. This part of the system is thus described by Mr. Doty :

“This reservoir holds 300,000 gallons, and the sewage is pumped from it as fast as received and before sufficient time elapses for fermentation to take place. The ventilation of the reservoir is perfect. Eight flues run from it to the top of the tower above it, and a twenty inch flue leads from it to the large chimney which takes the smoke from the fires under the boilers of the Corliss engine. The sewage is pumped through a twenty inch iron main to a sewage farm about three miles distant, and at the farm end of this main the sewage goes into a receiving tank which contains a screen placed in a vertical oblique position, through which substances that of more than half an inch in diameter cannot pass. The pressure of the sewage upon the tile piping in the farm is not allowed to exceed ten pounds to the square inch. The sewage from dwellings now, March, 1887, amounts to 100 gallons a day for each person of the population. This seems a large amount, but when it is remembered that every tenement is provided with the best of closets and sinks, and ten per cent of them with bath tubs, and that the water taps are all inside the houses, it will be seen that a large amount of sewage per capita is unavoidable.”

The receiving tank at the farm is elevated to such a height that a waggon can be driven under it and receive from a door in the bottom of it the solid matters, such as rags, boots, etc., that have been strained out. From the tank the sewage passes through vitrified tiles to hydrants distributed over the farm, in the proportion of about one to every two and three-quarter acres. From these hydrants it is allowed to flow intermittently into different portions of the farm. The soil is underdrained by means of porous tiles, and the effluent passes into mains, and from them into a ditch which discharges it into Lake Calumet. The subsoil drains are placed nearer together than in most irrigation farms, the distance being about 10 ft, and I should think from the nature of the subsoil and the configuration of the locality (which will be described hereafter) that this is absolutely necessary. Farms with a gravelly or sandy subsoil, and sloping towards the outfall, have a great advantage in this respect. From the experience he has had, Mr. Martin recommends that the subsoil drains should never be less than four inches in diameter. About fourteen acres are laid out in what may be termed the “flat-bed system.” The method adopted may be understood by reference to the accompanying diagram :—

d, e, f, l, m, and n, represent a set of six beds enclosed and separated from the next adjoining set, by the thick turf wall *h, i, j, k*. The set of beds is graded to a gentle slope downwards from *h* to *k* (*i* to *j*). In the centre of the wall, *h, i*, is situate a hydrant *O* enclosed in a box *b b*, in which latter are two small sluice gates *c c* by means of which the sewage may be allowed to form into the bed *d* or the bed *l* at will, *d e* and *f* being separated from *l m* and *n* by a central turf wall. By the gates *g g g g* the sewage may be confined to the upper beds *d* and *l* or allowed to flow on into *e* and *f, m* and *n*. By this rush-like manner of application a more even and uniform application of sewage may be made. For the rest of the farm (there are 140 acres altogether), there is no grading, it is naturally flat, and the “broad system” of irrigation is employed.

I saw some of the effluent in the mains, and it was quite clean and inoffensive. Mr. Martin told me that he had one day discovered some railway labourers sitting beside the ditch, making use of the effluent to wash down their luncheon. They were surprised when warned of its character, and said it was the sweetest water they had found in the neighbourhood.



PLAN SHOWING A SET OF BEDS LAID OUT FOR IRRIGATION
ON THE "FLAT BED" SYSTEM.

Mr. Martin gave me some valuable information as to the vegetation best and most profitable to raise. We have been accustomed to consider Italian rye grass as very suitable. Mr. Martin raised this in his first year and could neither sell nor give it away. It was so coarse and rank that stock raisers would not accept it as a gift. The vegetables which they found they can raise most profitably are celery, onions, and cabbage. Many other vegetables can also be raised. Potatoes cannot be grown at all, except as a decided failure.

In some years, the farm (besides being a profitable sanitary investment which it always is), has yielded as much as eight per cent. or over, but in other years— years of drought or of early frost it has yielded no direct profit; the outlay has never exceeded the returns.

The City of Pullman is admirably clean and well kept. I would like to refer to one of many things that I would note if time permitted, and that one thing is the excellent ventilation and absence of dust in the shops; over each dust producing machine in the process is a funnel; these funnels are connected with exhaust air-shafts, the exhaustion being produced by an extract fan situated over the boiler room of the great engine house. Into this room then the saw-dust is drawn, and it passes down to the boiler-room where it is burned. From an article by Mr. Doty I extract a few descriptive remarks:—

The city of Pullman is built scientifically in every part, and is exceptional in this respect. Here both the drainage and the sewerage preceded the population, and the soil is now as free from organic contamination as when it formed a portion of the open prairie. Every building, too, has been constructed from approved plans and under the supervision of competent builders and engineers.

The city is situated ten miles south of the city limits of Chicago and upon the west shore of Lake Calumet. The lake is about three and a half miles long by one mile and a half in width and drains through the Calumet River into Lake Michigan, which is a little more than three miles distant. The buildings already erected are upon ground which is from eight to fifteen feet above the level of the lake. The soil is a drift deposit of tough blue clay ninety feet in depth resting upon lime stone rock. The land gradually rises to the north and west to an elevation of twenty-five feet above Lake Calumet, this lake usually being from three to five inches higher than Lake Michigan. There is no land of a marshy character in the neighbourhood, the bottom of Lake Calumet even being of hard blue clay from which the best cream coloured bricks are made. It was deemed unwise to permit any sewage to flow into the lake, so the plan of drainage adopted is what is known as the *separate* one, and comprises two systems of pipes.

The fall is sufficient to secure good cellars or basements for all the dwellings of the city, the drain pipes leading from cellars to the laterals being at least eighteen inches below the cellar bottoms.

The parks and play grounds are all thoroughly drained. The lands surrounding the town are well drained by ditches.

The population of Pullman, October, 1886, was 9,000, and land enough is already piped for using the sewage of 15,000 people. The pumps at the pumping station can handle 5,000,000 gallons a day if necessary, and the iron main to the farm could carry the sewage made by a population of 50,000. These pumps are now required to handle a million and a quarter of gallons a day from the town and all the shops and public buildings. All the waste products of Pullman are carefully utilized, being largely transformed by vital chemistry into luxuriant vegetable forms.

Every provision is made for flushing and cleaning the sewers and for keeping them in perfect order. There is no town in the world where drainage and sewerage are so perfect as they are here, and the phenomenal health of the population is one of the results. Although supplied with the purest water from Lake Michigan, they do not look upon it as a benefit equal to that of the drainage and sewerage. Cases of zymotic diseases here are rare, and the death rate of the city was only 8 for every 1,000 of its people during 1886. The average death rate for most American cities is three times

that of Pullman, and the death rate for the whole world is placed at 32. Ample provision has been made for extending this system of sewerage and drainage to meet the wants of 100,000 people. Engineers, members of boards of public works, committees from common councils and legislative bodies from all parts of the country and Europe visit Pullman to study its construction and its sanitary advantages. It has become a recognized factor in all city building and in city extensions, and its great suggestive value is fully acknowledged and appreciated in both hemispheres.

Chicago.—To the courtesy of Dr. De Wolf I am further indebted for a trip to the water-works station. Additional works are now being constructed higher up the Lake.

Another project of great sanitary and engineering interest is the proposal to so deepen the water way to the heads of the Mississippi that a continuous cleansing current may be established from Lake Michigan to the Mississippi. At present this cleansing is partially carried on by pumping water from the river into the canal, but if too much is pumped the adjoining lands become flooded.

Chicago is also experimenting in the cremation of garbage, but as I have been asked by Dr. Bryce to read a paper on this subject at the forthcoming meeting of the Association of Executive Health Officers of Ontario next month I have purposely omitted reference to the discussions on the subject at Memphis and elsewhere till that time.

There were other papers and subjects discussed at the meeting of the American Public Health Association to which I would also gladly have referred had time and space permitted.

In concluding this report I wish to place on record my thanks to the various gentlemen mentioned in this report for their kind offices as set forth therein.

All which is respectfully submitted.

WM. OLDRIGHT.

APPENDIX

CONTAINING THE

ANNUAL REPORTS OF LOCAL BOARDS

IN THE VARIOUS

MUNICIPALITIES OF ONTARIO.

APPENDIX

The Appendix contains a condensed summary of the reports of the municipalities throughout the Province which by statute are required to transmit annually the Reports of their Local Boards. They include the reports of 9 cities, 27 towns, 33 villages and 173 townships, or 47 per cent. of the organized municipalities of the Province. The reports are of a very satisfactory nature, showing more complete organization of Boards than ever before, more exact methods of work and a more comprehensive and extended idea both of the work coming within the scope of the Boards and of their powers for carrying it into effect.

The reports while showing, in some instances, how much can be done, in others show how much there is yet to do. Taken as a whole, however, they show an amount of executive local health work most creditable to the Province, and which in some instances may well serve as models for other Provinces, and even some States where Health Boards have been in existence much longer than in Ontario.

ANNUAL REPORTS OF LOCAL BOARDS OF HEALTH.

CITIES.

BELLEVILLE.

Medical Health Officer's Report.

As Medical Health Officer of the City of Belleville for the year 1887, I have the honour to report as follows :—

At the request of the Board, I had the orders issued for the cleaning of yards and the emptying and disinfecting of water-closets, which was fairly responded to. I made a personal inspection of parts of Front Street, and inspected the slaughter-houses regularly during the season; at first, some of the butchers did not feel inclined to respond to the request of the Board, but upon shewing them that the Board was determined to carry out the requirements of the Public Health Act and upon insisting that the slaughter-houses should be regularly and systematically cleansed and disinfected and not allowing the accumulation of offal or other refuse matter about the premises. The butchers also seeing that it was for the protection of themselves, as well as the general public, came into line and assisted myself and the Inspector to carry out the requirements of the Act. And so satisfactory was this done that during the whole of heated term very few complaints were made either to the Medical Health Officer or the Inspector.

I may again say that during this year I have received numerous anonymous complaints, but could not act on them. The law is perfectly explicit and requires a complaint to be made by the party aggrieved, in writing, with his name attached, not for the purpose of publicity, but simply something to show that the complaint is of a *bona fide* character, and upon which the Inspector could act.

The Inspector has found great difficulty in performing his duties, owing to parties being unwilling to assist him in giving evidence against parties who have violated the law by depositing night soil and other refuse on vacant lots within the city limits. They complain of the nuisance, and in some instances, knowing the parties, would not assist the Inspector to convict them. I would again draw the attention of the Council of the absolute necessity of at once procuring a proper place for the depositing of night soil and other noxious matter.

During the year the city has been at considerable expense by removing night soil and other refuse deposited during the night time on vacant lots in the city. I would again request the city to either pass a by-law licensing one or more scavengers for the city, or make such parties register, so that the police would know who was doing such work, and by that means could detect such parties guilty of such breach of the Public Health Act, as well as the city by-laws.

I am glad to see that the city has responded to the repeated requests of the board, and has had a complete survey of the city made for a thorough system of drainage, and trust that no time will be lost in submitting the plans of such system to the Provincial Board of Health for its approval; the water-works will be in operation next year. Drainage, therefore, is an absolute necessity.

I must again congratulate the Council on the healthy state of the city for the year 1887. Whilst other cities are suffering more or less from diphtheria and scarlet fever, we have so far escaped, there not having been one single death or a case reported of

either of those dread diseases since January, 1887. There has been more or less fever during the months of September and October. The profession is divided as to its character, some maintaining that it was of a typhoid character whilst others contending that it was malarial. The mortality was very low. There has been three deaths recorded as from malarial fever, and only one case of typhoid fever early in the year. This is a remarkable shewing in contrast with other cities, in a great many of which scarlet fever, diphtheria, and typhoid fever is prevalent during the whole of the year, and speaks well for the City of the Bay. I only trust that we will keep up the reputation of our city, which can only be done by extreme vigilance and a thorough and fearless enforcement of sanitary laws, in which any inhabitant of the city is as much interested as your medical health officer, and hope that past efforts and success will not make us careless, but with renewed energy and determination, we keep our city in the proud position she now occupies as having the lowest death-rate per 1,000 of any city in the Dominion.

I determined this year to have a thorough inspection made of the city, and a house to house inspection made. I therefore instructed the Inspector to visit every house, to look carefully after the source of water supply, inspect all water-closets and yards and premises generally, which was done.

The Inspector has been of great assistance to me, and the work done by him has been of a thorough character, every complaint has been cheerfully attended to and regular visits made to the slaughter-houses, hotel yards and all yards on Front Street. His attention also has been given to the market, and the improvement there is very gratifying. While his duty is some time of a disagreeable character, his manner in the discharge of his duty has won him the respect of the citizens, and some who at first looked at him as wishing to be officious now see that he was simply doing his duty, and are willing now to do all in their power to assist him in the discharge of his duties.

I have had printed, in accordance with the Public Health Act, blank notices for infectious diseases and supplied every physician of the city with them. Also sending to each one of them a circular drawing their attention to the clause of the Act requiring them to notify the Medical Health Officer of any case of infectious disease, and trust that they will comply with the requirements of the law, as I have no option but on this neglect in so doing but to carry out the law. I hope that I will not be forced into such an unpleasant position, but that instead of putting obstacles in the way, they will do anything in their power to assist in the discharge of my duties and protect the health of the citizens.

R. TRACY, M.D.,
Medical Health Officer.

BRANTFORD.

Medical Health Officer's Report.

I have the honour to present the following annual report on the sanitary condition of this city, and on the sanitary work done during the year.

The whole number of deaths occurring within the city limits during the year was 212, or about 16½ per thousand for a population of 13,000.

Of these 212 deaths, sixty-three or thirty per cent. were due to zymotic diseases, nineteen having been caused by diphtheria, eight by typhoid fever, nineteen by cholera infantum, four by cholera morbus, and the remaining thirteen by other diseases classified as zymotic.

Of the nineteen deaths from diphtheria, nine occurred in the month of December, '86. So that up to November 1st of the present year, the actual number of deaths was ten, during the ten months; two of these were in October, leaving eight cases of fatal diphtheria for the nine months from January 1st to October 1st, which corresponds with the recent report of the Provincial Board of Health covering that period.

By amendments to the Public Health Act, made in the last session of the Legislature, more stringent regulations with regard to notification of contagious diseases and

to exclusion of children from school, coming from affected households, have been prescribed.

By the enforcement of these regulations it is hoped that the spread of diphtheria, as well as of scarlet fever and measles, by means of the schools, will hereafter be more effectually limited.

The spread of these affections by the agency of the Free Library, as well as by other circulating libraries and by school books, is also a serious danger.

The handling of books by children whose fingers are contaminated by diphtheritic discharges, or whose skins are exfoliating after scarlet fever, etc., and the subsequent circulation of such books, may justly be regarded with alarm.

Mr. Woodyatt has recently brought this matter before the Free Library Board, who have referred it to this Board for action. It is proposed, with your approbation, to take without delay the most effectual measures in our power to lessen this danger.

The steady persistence of diphtheria throughout the summer, the severity of the choleraic affections, and especially the continued prevalence of typhoid fever in Brantford this year, are all matters calling for serious consideration. For although the annual death-rate is very moderate, these affections are in a great degree preventable, and represent a large amount of unnecessary disease and death.

The canal basin has this year been filled with fresh moving water, and has probably not been a cause of increased disease.

The drinking water of Brantford, derived entirely from wells, which for many years has been for the most part either bad or doubtful, and necessarily growing constantly worse, has this year been worse than ever known before.

Owing to the unusual drouth the water in most of the wells has been extremely low, a large proportion of them becoming nearly stagnant pools, with little to feed them except the soaking of impure liquids from the surface in the near neighbourhood.

I think it reasonable to assume that had the canal basin been in the same bad state this year that it was last year, the amount of typhoid fever, etc., would have been so much greater than it has been.

Many illustrations might be given of the direct effect of this condition of the well water in producing disease. I will here only mention two or three.

In one dwelling near the centre of the city, the family used the water in their own well until it became very low and soily; they afterwards obtained water from a well on the market square, which gave a larger supply, though of no better quality.

There occurred in this family four cases of regular typhoid fever, and one case of diphtheria. Of four visitors who resided with them for some weeks, three had diarrhoea soon after coming to the house, and one had diphtheria. Three remaining members of the family were not affected.

In another locality, half a mile distant from the above, in an area of about 300 rods, on which are eight first-class detached brick residences, with several stables, in use for a quarter of a century, and with no kind of drainage whatever. There were in five of these houses ten cases of regular typhoid fever, besides several cases which had some of the symptoms, though not severe—enough to require confinement to bed. One of the cases resulted fatally from perforation, and two of the cases are at present in the hospital.

In one of these dwellings there was also a severe case of typhoid last year, in which case the patient, a boarder, declared that the water "made him sick," and gave him diarrhoea on his first coming there.

In a third locality, remote from either of the above, there are two double frame tenements on one lot. In three of these tenements there were four cases of severe typhoid last year, and one severe case this year. The well on this lot was ordered to be filled up, and it was found that on pumping out the water for that purpose, the liquid in a deep privy vault, some twelve feet distant, at once disappeared.

I shall not dwell further upon this matter, because the urgent necessity of effective measures to provide Brantford with an ample supply of good water is generally realized, and because I believe every possible effort consistent with due caution is being taken to accomplish that object.

We can at present only hope that these efforts will speedily be successful.

Second only in importance to the question of water supply is that of *sewerage and drainage*.

It is surely extraordinary that a city of 13,000 inhabitants should have no sewerage whatever, no provision even in its most closely built places for carrying off foul liquid refuse.

At present I shall only take time to refer briefly to the subject, having expressed my opinion upon it before.

Sewerage for the central parts of the city is imperatively called for by every consideration of health, cleanliness and decency.

The Separate or Waring system of small pipes is the best for Brantford, and it is extremely cheap as compared with the combined or large sewer system. The sewers in this system are automatically flushed every day. No time is given for the generation of sewer gases. It is competent to dispose completely of the water in cellars, where this is required, and the cost of maintenance is trifling.

The property owners in the locality where it is most required, would gladly defray the larger part of the cost by a local assessment. In localities where the buildings have sufficient ground, sewerage is not required, and the assessment need not be imposed.

It is therefore earnestly to be hoped that when the capital necessary for water works is raised, the public will insist that a moderate addition to the amount required be made for this purpose.

The amount of sanitary work done during the last twelve months has been large.

Mr. James, the Sanitary Inspector, is an excellent officer, and has performed his very numerous and responsible duties in an extremely satisfactory manner. His books shew that he has made during the year, 843 house-to-house inspections, as against 620 in the previous year. This number is much greater in proportion to population than has been made in any other city in Ontario; it is more than twice the proportional number of inspections made in Toronto last year.

During the year, from November 1st to November 1st, 307 privy vaults have been emptied under the directions of the Inspector, and it is believed that this service is now being performed in a manner to cause no complaint either in the city or in the township.

Two hundred and seventeen complaints in all were entered on the complaint book in the Health Office, as against 155 last year.

Nearly all the various matters complained of have been satisfactorily dealt with. The imposition of a moderate fine in a few instances, has materially lessened the difficulty in enforcing compliance with the sanitary regulations.

The Sanitary Inspector has, during the year, inspected all the dairies supplying *milk* to the city. I accompanied him in the inspection of four of the largest dairies, and was well satisfied with the condition of the cattle and the byres, and with the character of the food used.

Notwithstanding a recent statement of Dr. Covernton, Chairman of the Provincial Board of Health, that the law with regard to milk inspection was practically only on paper, I have to state that whatever may be the facts in other places, the statement is not correct as to Brantford. No person here is allowed to sell milk without a permit signed by the Chairman of this Board. Thirty-three such permits, for dairies large and small, are now in force representing 351 cows, and no permit is granted for longer than six months.

Every one of these dairies has been inspected this year, and the results of every inspection entered in the book kept specially for that purpose in the Health Office.

The instructions of the Sanitary Inspector are to report forthwith any animal apparently ailing, in which case a veterinary surgeon must be sent to investigate. The certainty that the milk of tuberculous cows is capable of conveying disease to human beings establishes the importance of careful inspection.

It is very desirable that such inspections should be made more frequently, especially during winter and spring, and I confidently expect such more frequent inspections will hereafter be made.

EGERTON GRIFFIN,
Medical Health Officer.

GUELPH.

Medical Health Officer's Report.

In compliance with the requirements of the Public Health Act, I have the honour to lay before you my annual report on the sanitary condition of the city during the year ending 15th of November, 1887. The city has been remarkably free from disease. Diphtheria and typhoid fever prevailed to some extent, sixty-two cases of diphtheria and sixteen cases of typhoid fever have been reported during the past year; eight cases of diphtheria and two of typhoid have proved fatal. The number of deaths from all causes during the past year has been 159, which includes all deaths occurred in hospital and gaol, giving a death-rate of 15.14 in a population of 10,500. The work of sanitary inspection has gone steadily on, and frequent inspections of slaughter-houses and cow byres have been made, the slaughter-houses in the city are found to be generally satisfactory. Complaints have been made several times about one or two and on investigation have been found not altogether without cause, and in one of the cases the inspector was obliged to bring the owner before the police magistrate. A large number of complaints have been made during the past year. With regard to the hog-pens against which so many complaints have been made, I am glad to say that they are fast decreasing. I would strongly recommend that some system be adopted for the removal of garbage, as it is now garbage is dumped here and there and everywhere to the great annoyance of the public. I think that scavengers ought to be employed and the whole of the garbage of the city cremated. During the past year the contractor for the removal of night soil has been kept well employed, 250 closets have been emptied and the contents removed to the nuisance ground, where it has been turned into manure and the greater part sold. No complaints have been made by any one this year regarding the nuisance ground, it having been kept clean and all smells kept down. During the year 100 dead animals have been taken from the river and streets of the city; they have been properly disposed of. It would be a good thing if some one could be caught in the act of throwing these animals into the river and have them punished, as they are a great nuisance and annoyance to those who are in the habit of boating. Only a few of these dead animals have been found above the water works, most all of them are on this side. During the month of July I gave instructions to have the river, from the Eramosa bridge to Allan's bridge, cleaned of weeds and other rubbish which was causing a very unhealthy smell. Complaints were made all through the summer about the bad smells arising from the banks of the river, caused by the water being drawn off at night for the electric light.

The creek, running from Present's mill-race and along Surrey street, was thoroughly cleaned in August last from one end to the other. During the past year twenty-five wells have been cleaned and six have been closed and city water used instead.

The Sanitary Inspector reports the following work done during the past year:

Number of yards examined	240
" water-closets emptied	250
" yards found in good condition	190
" hog-pens removed	17
" notices served for dirty yards and closets	49
" old wells closed	6
" analyses of well water	3
" dead animals buried	100
" complaints made at Inspector's office	150

Contagious diseases reported:—

Scarlet fever	26
Diphtheria	62
Typhoid fever	16
Houses placarded	88

Report of the expenses incurred by the Board during the past year :—

Removing nuisances and dead animals, and general work	\$ 78 05
Cleaning out creek from Present's mill to river	33 00
Hire of horses and buggies for Inspector to visit places at a distance	5 00
Analysis of well water	4 00
Paid Acting Sanitary Inspector, G. Knowles, while Inspector was on leave	13 00
Advertising spring cleaning	2 70
Rent of nuisance ground	100 00
Stationery for office	6 25
Cleaning river	25 00
Printing bill heads and contagious disease cards	16 00
Total	<u>\$283 00</u>
Amount granted by Council	\$200 00
Amount overdrawn	83 00

In closing this report I beg to state that the Sanitary Inspector has performed his duties to my entire satisfaction.

THOMAS ANDREW KEATING,
Medical Health Officer.

HAMILTON.

Medical Health Officer's Report.

The inconvenience arising from making a report up to the date of presenting it is so great that I follow the example of other medical officers, and make the fiscal year end on the 31st of October.

During the past year 1,728 cases of contagious diseases were recorded at the Health Office, namely: scarlatina 177, deaths 2; diphtheria 205, deaths 31; measles 1,277, deaths 2; and typhoid fever 69 cases and 8 deaths. The corresponding months of last year (1886) gave scarlatina 109 cases and 2 deaths; Diphtheria 214 and 67 deaths; measles 3 cases, and typhoid fever 25, with 2 deaths. It will thus be observed that, although this year diphtheria cases are only nine behind those of last year, yet, the deaths are less than half, while scarlatina is sixty-six in excess, the deaths being equal. Typhoid fever cases are nearly three times as many and the deaths eight to two.

I have had a number of premises inspected, particularly where typhoid fever existed. Nothing more than the usual state of matters could be detected. I will give a few instances. —Three cases occurred in one family of nine members, reported to be very poor and dirty in their habits, to avoid expense a privy vault, situated in the shed near the dwelling, had been secretly covered over without first removing the contents. Five cases occurred in another house where the grading of the lot was towards the dwelling, slop water, suds, and hard to say what else were found running under the kitchen floor. Two cases occurred on Hannah Street, east of Catharine, which is situated on high ground; a privy vault was located within ten feet of the house, full and offensive, adjacent property contained two large double vaults, smelling badly; those vaults were wide and very deep, evidently intended by the owner to obviate the necessity of cleaning out for a quarter of a century, they were ordered to be cleaned out and subsequently to be filled in. I may here state that privy vaults should not be permitted so near dwellings when neither exigency nor circumstances require them.

A few places were examined where no unsanitary condition of premises could be detected. One was the case of a man who had been engaged putting in sewer pipes; two

other cases were imputed by the family to weakness and hard work. Cases have been imported from different parts of the country, all of which help to swell our number.

Measles has been epidemic; all the cases which occurred were not reported, the disease was apparently light as only two deaths were recorded; in a few cases diphtheria appeared to be coincident or follow closely on measles—diphtheria and scarlet fever have been notified from the same house at the same time. Some cases of the latter have been so mild that no rash was noticeable, the disease being diagnosed from sore throat and peculiar condition of the tongue. I have great doubts that such cases will be sufficiently protective against a future attack. Notice of recoveries appear to me to come in too soon after report of the disease, frequently in less than a week, and in some cases before the skin has fully exfoliated. I do not think that any cases should be reported as having recovered until all danger of contagion had passed away. How long should that be? Our Provincial Board of Health *should settle that matter*; according to the amended Public Health Act of last session, Medical Health Officers are required to notify all schools of contagious diseases where children had been attending; they are also required to give certificates for them to return to school, in both cases any other physician can do the same, so that the attending physician and Medical Health Officer may be doing double work. In my opinion the work would be more satisfactorily done by the latter; the law was evidently devised by a lawyer, it is made as confusing as possible. With regard to the placarding of houses the rule ought to be made general, it looks somewhat ridiculous to placard houses on Wentworth or Concession Streets, in the city, while the opposite side, in the Township of Barton, is privileged to go free, indeed the limits of the city should extend considerably south and east for sanitary as well as for other substantial reasons.

Having visited the vicinity of the Fergusson Avenue sewer on several occasions during this past summer, I have no hesitation in saying that your Board, under the circumstances and with the means at your disposal, adopted the best plan of allaying what was a most intolerable nuisance; at the several visits made I could find no more, nay not as much cause for complaint as those living in more populous parts of the city have to endure occasionally. I go further and say that the emanations arising from putrescent excreta, fermenting in privy vaults, is far more pernicious to health than what escapes from the sewer in solid form when the latter is collected and covered with earth which destroys putrefaction; you have been reclaiming ground which will prove valuable for city purposes, a foot deep of earth over the ground already made would be advantageous.

Having accompanied your Board on two occasions during the year to inspect factories which were reported to be unsanitary, and seeing them in full operation, I was surprised to see how so much work could be done with so little nuisance; seeing the healthy look of those employed at the business I could not take upon myself to say that those factories were injurious to health, every precaution seems to be taken to render the business as less offensive to the public as possible. There are, however, certain idiosyncrasies which are affected by strong odours, such as the rendering of lard, which otherwise does not appear to me to have anything pernicious in it. I believe that the principle complaint made against one factory was due to some very offensive smelling fat, which came by rail from Toronto and was carted through the streets; such an occurrence is not likely to occur again. There are certain manufactures which cannot be carried on without causing more or less of a nuisance; as long as the latter are kept within bounds I do not see that your Board is required to do anything more. If the wishes of certain individuals were to be carried out the result would be to check industries now giving employment to the labour. Our sewers, however, should be protected from the entrance of such offensive matter as periodically causes our streets and houses, in certain localities, to be almost unbearable; our sewer should be flushed out more frequently and especially so in very dry weather.

The inspection of food, having recently been attended to by Inspectors Peacock and McKillop, I am pleased to be able to say that so far they have done good work in the interests of the general public, and no cheating in the market will be countenanced. I have seen some of the fowls confiscated by them and considered them unfit for food; those sent to charitable institutions were seized on account of breach of the by-law, all others were destroyed. The late respected Food Inspector was very energetic in his work; as

his duties were under a different Board I am unable to say anything about them. The Public Health Act and by-law now places the inspection of food under the Board of Health. I am not aware that any inspection of milk took place last year; to have that effectively carried out I would recommend your Board to adopt the license system, and none but those who can supply good milk from clean dairies should be licensed; milk is one of the most important articles of food and should receive strict attention as to the source of supply.

Inspector Peacock has compiled a statement of work done during the year, it speaks for itself. Mr. McKillop states that the scavenger work has been fairly carried out, but that there are yet too many complaints recorded, which must be stopped, or else that valuable work will get into disrepute.

As members of your Board may take some interest in statistical information I append a statement of contagious diseases by months and by wards, and also the number of deaths and rate of mortality by months. The deaths this year numbered 715, taking the population at 42,000, which is an under-estimate, the death-rate is 17.02 per 1,000. I also give a statement of the mortality for eleven years; I compiled it principally for the Dominion Medical Association, to let the members see that our death-rate was creditable. I am sorry to say that they seemed to take very little interest in anything but what was on their programme. I give it now as a correct statement. In 1876 it was rather difficult to make out the non-residents as no record was kept at that time of the place of residence, since then a full record is kept. The causes of death are, however, in many cases not reliable, as the superintendent has to take the cause from the person who came to have a grave opened. The cause of death is a very important item in mortuary statistics, and in all cases a physician's certificate of the cause of death should accompany the application for a grave; this is done in other cities, why not in Hamilton? The number of cases unregistered is very great, but I presume that it is no greater than it has been in other places.

With regard to the advent of cholera into this country next year, I am afraid that the germs of that disease have already got a footing on this continent, and from all accounts the sanitary precautions at New York are of a most unsatisfactory nature. Dr. DeWulf, the Medical Health Officer of Chicago, has pointed out that the real danger lies in clothing coming from infected countries, which receives little or no attention from the sanitary authorities; should the disease get established in the United States we may well be prepared for it in Canada, and take time by the forelock. I have been informed by the Secretary of the Provincial Board of Health that the medical report for 1886 was not forwarded in accordance to the requirements of the Public Health Act. It is to be hoped that it will be attended to in the future.

J. RYALL,

Medical Health Officer.

KINGSTON.

Medical Health Officer's Report.

I have the honour of submitting the following report upon the sanitary condition of the City of Kingston, in accordance with the Public Health Act; such a report necessarily will be brief while dealing with the many important sanitary questions:—

Water.—The first and one of the most important subjects, is pure water, which should be perfectly colorless, limpid, sparkling, sweet tasting and odorless in condition, such as entirely satisfactory drinking water ought to be. Now, before satisfactory results can be obtained, "in so far as our water-works go," it would be necessary to have the in-take pipe extended further out into the river, so that it may be free from any contamination arising from deposits out of our drains or other refuse matter surging along our shores, to make it more reliable. Now that the city has entire control of the plant, might it not be advisable to take into consideration the purchase of a filter, and thereby free the water, for domestic purpose, entirely from all organic matter, which cannot be overestimated.

I would also recommend the closing up of all polluted wells (which is a fertile source of disease) on line of streets wherever the water pipes are laid.

Ice.—The supply for domestic purposes, now used by our citizens, is taken much further out in the river than formerly, in clear deep water, thereby being more likely free from any organisms which might be found if cut nearer to shore and in shallow water, arising from the up-heaving of organic matter caused by the surging of the waves in the fall of the year; instances are on record of certain diseases being traceable to impure ice.

Milk Inspection.—The inspection of milk should be carried out, it being the chief article required by our infant population, and is one that fraud may be carried on to a great extent, there being little danger of detection by the ordinary consumer; milk should contain twelve per cent. of milk solids, and of that there should be three per cent. of fat; milk from the cow will register high (from 110° to 115°) and show by analysis from thirteen to fourteen per cent. of milk solids; water may be added until the lactometer register down to 100°, which will show the required per cent. of milk solids, less the three per cent. fat in the most of cases.

Drains.—During the year 1887 \$11,449.56 have been spent in the construction of 2,680 yards of drainage added to our city sewers, which will prove of great benefit to the many localities through which they pass, but to carry it out to more perfection, would it not be well if our City Council would consider the advisability of constructing an intercepting sewer that might be emptied into Cataraqui Bay, thereby preventing the pollution of the water in our city front, rendering the air along our harbour free from the noxious gases escaping into it, caused by the decomposing organic matter flushed from time to time into the water at the mouths of the several drains.

Contagious Diseases.—Cases reported during the year, diphtheria, twenty; scarlet fever, eighteen; measles, forty-seven; typhoid fever, fourteen. Every case reported is referred immediately by the Sanitary Inspector to the proper authorities of all schools; then no child out of that dwelling is permitted to attend school until a sufficient length of time has elapsed and a certificate is obtained from the attending physician for its readmission. If active and prompt measures (isolation and disinfection) were applied at the outset in all cases of a contagious or infectious disease, we would look for the prompt suppression of diseases of this character.

Sunken Lots.—There are many lots in our city containing stagnant water, which is a great annoyance to residents in the several localities, and is certainly detrimental to health, which might be provided against by our City Council taking charge of the matter and compelling owners to fill them up, thereby rendering them more healthful.

Garbage.—A contract or agreement was entered into for the removal of ashes, garbage and all refuse matter, for a nominal sum, daily or as required; but I am sorry to say that many of our citizens did not respond to the call of aiding us in the carrying out of this most necessary work.

Vaults.—I wish to draw the attention of the board to the necessity of a house to house inspection by the Sanitary Inspector, who should keep a book in a tabulated form, showing the results of his work; the only accurate way of ferretting out nuisances are necessities of all such inspections. During the year 332 privy vaults have been emptied, by permits, under the odorless system (by contract) and removed to a distance in the county, and placed on land for fertilizing purposes, or buried in trenches and taken charge of. Privy vaults should be built water tight and be cleaned out at least once every year, and kept properly disinfected, thereby aiding in the prevention of preventable diseases which exist in our midst. Many of our privy vaults are built in such a manner as to be receptacles for all waste water, and being flushed into our public drains, causing stoppages in the dry season, resulting in the escape of noxious gases into the atmosphere, making it unbearable at times.

Parties making use of drains for such a purpose, do so at the expense of the health of citizens, and to save themselves the expense of cleaning their receptacles.

All leaking privy vaults should be abolished, as they saturate the soil, poisoning that, and contaminating the wells close to them, thereby rendering them dangerous and fruitful sources of diseases.

S. H. FEE, M.D.,
Medical Health Officer.

LONDON.

Medical Health Officer's Report.

I have the honour to lay before you my annual report for the year ending November 15th.

No epidemic visited the city during the year, and only four infectious diseases. There were 455 deaths from all causes. Taking the population of the city according to last year's assessment returns, at 26,500, places the death-rate at a fraction over 17 per 1,000. Taking into consideration the large number of people from the rural districts, who come to the city to avail themselves of its hospital and charitable institutions, this is an exceedingly low death-rate, and speaks well for the sanitary condition of the city. Of the infectious diseases, 102 cases of diphtheria were reported at the Health Office, and thirty-five deaths. Of typhoid fever, there were sixteen cases reported, and seven deaths, which shews that all the cases of typhoid fever were not reported, many of them being conveniently credited to malarial fever, a non-contagious disease, otherwise this would be a very high death-rate. Of scarlet fever, there were eleven cases reported, and no deaths. Taken by wards, eleven cases of diphtheria occurred in the 1st ward, seven in the 2nd, twenty in the 3rd, twenty-one in the 4th, and forty-three in the 5th. Of typhoid fever, five cases were reported from the 3rd ward, two from the 4th, and nine from the 5th, none being reported from the 1st and 2nd wards. It will be noticed that those wards farthest from the river suffered to a much greater extent than those adjacent to it.

The inspection of milk, cow-byres and drains, commenced during the year, in accordance with the by-law, is being very thoroughly carried out, resulting in a marked improvement in the quality and cleanliness of the milk. Many of the suburban milk vendors do not purchase straw for bedding purposes, and not having land to raise it, the cows, in consequence, become filthy. Where this is the case it is almost impossible to have clean milk. The by-law is being strictly enforced, and will, no doubt, result in the cancellation of the licenses of many of these small milk-vendors. This is so universally used as an article of food—to say nothing of its power of conveying infectious diseases—that careful and frequent inspection is necessary in the interests of the public health, and the importance of having a pure supply, especially in the saving of infant life, cannot be over estimated. Sixty-seven permits to obtain licenses have already been given, subject to cancellation for infraction of the by-law.

A number of bad wells and cisterns have been closed during the year. The city waterworks system is gradually pushing these wells out, but not fast enough. Well water is so liable to contamination from surface drainage, pollution through the soil from water-closets and other sources, that wherever the city water is available they should be prohibited.

The unsanitary condition of London West calls for the serious consideration of the citizens of London. That suburb is in a very unsatisfactory state, and a source of danger to the city. The second Medical Health Officer appointed during the year, has resigned, and it is not now likely that any intelligent system of sanitation will be carried out. Cholera is in New York City. The winter will no doubt check it, but should it visit this continent in the spring, as it has before, it will find no more favourable breeding ground than London West. The best, and probably only way to remedy the evil, would be to annex it to the city. It would then be put in proper condition.

T. V. HUTCHINSON, M.D.,
Medical Health Officer.

OTTAWA.

Medical Health Officer's Report.

In laying this before you, my annual report for the year ending October 31st, 1887, I must apologize for its briefness, necessitated by the amount of labour devolving upon me and other circumstances beyond my control. The public health throughout the year, as evidenced by the decrease in mortality as compared with last year, which appears in the mortuary returns here appended, is a fair subject for congratulation. It is a pleasure to note that during these twelve months, the community has enjoyed comparative immunity from epidemic diseases, and the mortality among infants has been considerably less during this than in the summer of 1886.

Diphtheria, which during the year prevailed extensively throughout the Province, did also in this community claim a certain number of victims, which would undoubtedly have been much more numerous had not the strictest supervision been exercised and isolation enforced either at domicile or in hospital, in all such cases known to the Department. I regret to say, however, as regards this, that I have to contend with much opposition from the people who are wilfully neglectful to notify the health authorities of the occurrence of such cases.

Typhoid, or rather enteric fever, of which we generally have a few cases, occurring usually during August and the fall months, did make its appearance somewhat earlier in the summer, probably owing to the peculiar meteorological state of the atmosphere which had prevailed since spring. The sanitary improvements carried out during the year in the city, were such as to clearly prove that the authorities are fully alive to the importance and necessity of such work. It is to be regretted, however, that as regards the laying of public drains, the law is such as to leave the decision of their necessity to the people, who, as a rule, in such matters are blind or indifferent to their own interest.

Your Board should endeavour, at the next Session of the Provincial Legislature, to have the law so amended as to give health authorities full power to carry out any such work whenever deemed necessary. Whilst on this question of drainage, it will be sufficient for me to mention the desirability of having the Lewis Street drain, which now empties into the canal, connected with our sewerage system. The Board is fully aware of the necessity of this change, and no doubt it will be carried into effect during the coming winter. With a view of protecting the public from all possible source of danger, all milk vendors dealing in the city have been compelled to register their names at the Health Office, in compliance with the law in such matter enacted, with the object of causing an inspection of the premises, to inquire into the source of water supply, the condition of vessels and apartments wherein milk is stored; also, the condition of cans, stables and character of food used. This work yet remains to be done, except so far as dealers residing in the city, most of whom have been visited, and, as a rule, found to have premises ill adapted for this business; in no instance, however, among these is the milk stored on the premises, but is immediately carried away and distributed to customers. At the demand of your Board, a by-law was passed by the corporation to regulate the ice supply, which very properly prohibits the cutting of ice for any purpose on the Rideau River. In accordance with this by-law, butchers can, if they wish, take their supply from the Ottawa River below the Chaudiere Falls, whilst all ice dealers must take theirs from above the Falls, and at a point sufficiently distant from the shores, to avoid the pollution of the now too famous Rochesterville Creek. Owing to the want of adequate help, the house to house inspection, with a view of enforcing health regulations and cause the removal of all unsanitary conditions, was not up to this fall done in a way to satisfy the requirements of sanitation, or minimise so far as it is in our power to do so, the development of preventable diseases. I am happy to state, however, that the addition to the health office staff of a competent sanitary inspector, since October last, will, I am convinced, contribute largely to the efficiency of this department. As evidence of the value of the work over which he exercises supervision, I here append a brief report of the work done by him during the first month of his connection with the health office, in which is also shown the number of privy pits emptied during the year, as compiled

from the books of the assistant inspectors who superintend this work. The fact that 2,485 vaults were emptied last year is evidence that this work was fairly attended to; though not as thoroughly nor yet done within the time most desirable within which it should be done, that is winter months. The proper disposal of household garbage and a regular system of scavenging are sanitary questions in which the community is much interested and which will before long, it is to be hoped, be satisfactorily solved by carrying into effect the contemplated project, erecting a cremating furnace wherein all such offensive matter could be destroyed.

The hospitals for the isolation and care of patients suffering from contagious diseases are at all times available and kept on a very satisfactory footing. In the Protestant annex for contagious diseases there were admitted during the year forty patients, of whom thirty-four were discharged cured and six died.

In the Roman Catholic hospital, twenty-two patients were admitted during the same period, of which seventeen were discharged as cured and five died.

A. ROBILLARD, M.D.

Medical Health Officer.

RECORDS OF THE BY WARD FOUNDLING INSTITUTION FOR THE YEAR 1887.

Number of children remaining at the end of the year 1886.....	22
Admitted this year.....	153
Total.....	175
Children placed or discharged durin present year.....	50
Died during the year.....	109
Remaining in Institution.....	16
Total.....	175

Respectfully submitted,

A. ROBILLARD, M.D.

HEALTH OFFICE,

OTTAWA, 13th December, 1887.

Ald. WHILLANS,

Chairman of the Board of Health.

DEAR SIR,—My report of the work done in this department for the year ending 31st October, 1887, will necessarily be very short, as it will only refer to the work performed during the last month of the sanitary year, with the exception that I give the number of privy vaults, etc., emptied under the supervision of the Assistant-Inspector for the whole year.

For the removal of nuisances there were issued to proprietors seventy-two notices; to tenants, twenty-eight; for the removal of pigs, one; for the removal of dead animals, one; to prohibit carpet-beating, one; to prohibit the sale of milk, one; to disinfect dwelling-houses, one. Total 105. Privy vaults, etc., emptied, 2,485.

The notice to proprietors include the following, viz.:—Houses unfit for habitation, want of drains, defectively constructed drains, untrapped and unventilated soil and waste water pipes, sewer gas escaping into dwelling-houses, unhealthy work-rooms, want of privy or water-closet accommodations, accumulations of garbage and other dangerous refuse, badly constructed privies, damp cellars, bone boiling, etc. Those to tenants are principally:

filthy cellars, dirty yards and premises, foul sleeping apartments (through want of ventilation) having hens living in rooms, kitchen refuse and slops scattered everywhere. The latter, as I have already pointed out, is more the misfortune than the fault of tenants, as proprietors of houses to rent do not, as a rule, provide receptacles for such matter.

I am, Sir,
Your obedient servant,

GEO. McNEIL,
Sanitary Inspector.

STRATFORD.

Chairman's Report.

Early in the spring the Board caused the usual proclamation to issue, calling upon the citizens to clean up their premises. This, with very few exceptions, was cheerfully complied with.

Several complaints were made with regard to slaughter-houses, situate near the limits of the city, but upon request of the Board the owners promptly abated nuisances.

A few other complaints were received by the Board during the year, but in all cases the remedies were easily effected.

The sewers were flushed frequently.

The creek running through the centre of the city was cleaned out to above where any sewers discharge into it.

We had four deaths from diphtheria during the year, and one from typhoid fever; these were the only deaths from diseases of an infectious nature.

The Board is happy to say that very little disease existed during the year, and with above exceptions, of a mild form.

The mortality of the year has been again very low; only ninety-one deaths have occurred.

ISAAC RELGY,
Chairman.

ST. CATHARINES

Chairman's Report.

In accordance with the requirement of the Public Health Act, I have the honour to submit the fourth annual report of your Local Board of Health for the year ending November 15th, 1887.

During the year just closed, your Board has continued the closing of cess-pools, privy vaults, etc; also the removal of garbish from yards, lanes, etc.

This work has been done in a manner satisfactory to the public, both as regards the cost and efficiency.

The Inspector has made regular tests of the milk supplied by vendors, of whom there are fifteen.

The quality of milk is of good standard, and better than when first inspected.

Slaughter-houses are regularly inspected, and are found to be kept in very good condition.

Cow-byres have received regular and systematic inspection, and as a rule the cattle are in good order, well fed, and the premises in a very satisfactory state.

The hog nuisance has not been as great as in former years, and your Board would

again call your attention to the necessity of having the Public Health Act amended, so as to prohibit the keeping of these animals within the limits of any city.

The lanes and alleys have been kept in very good order during the year, but your Board would call your attention to a great nuisance committed by many people during the winter, viz., dumping ashes in the streets ; this should be prohibited, and the offenders punished as the law directs.

Your Board note the fact with pleasure that the Welland Avenue drain has been extended below lock two, and that a system of drainage has been inaugurated in the western portion of the city, and we sincerely trust that the result which the most sanguine supporters of the scheme anticipate, will be fully realised.

Your Board trust that the work now under construction is being done in the latest and most approved manner, and that the drains will be provided with the necessary ventilation shafts, man-holes, etc., in order that the best results possible may be attained.

It may be hoped that the drainage of that portion of the city lying between James, King, Court and Church Streets, will not be neglected, and that the work will be proceeded with at the earliest possible moment, as it is well known that the thickly settled portion of Academy Street, between King and Church, is in a very bad sanitary condition for want of proper drainage.

Your Board desire to congratulate the Market and Building Committee on the thoroughly first-class manner in which they have carried out the suggestions of this Board *re* water-closets in connection with the city buildings and market grounds. This has been effected by the removal of the old closets and privy vaults and erection of a new brick building, which contains public closet and urinal, also closets for the caretaker and city officials. In order to make new closets efficient, a sewer was constructed from the city buildings down James Street, connecting with the Welland Avenue sewer.

The closets introduced are known as the Parson's trough system, and are of the latest and most improved character.

During the year the Board has had an analysis made of the well water on several streets of the city, and find that in almost every case the water is unfit for use, and your Board have decided to take prompt action, and have instructed the Inspector to see that the bad wells are closed up at an early date, as in case of cholera or other epidemic breaking out in our midst, the users of bad water would most assuredly be the first victims.

The residents of the city are to be congratulated on the satisfactory state of the public health during the past year. Fortunately the city has not been afflicted with any epidemic. It is true that diphtheria was more prevalent than during the preceding year, but the percentage of deaths even from this most fatal of diseases was very low.

The total deaths from all causes during the past year was 141, as compared with 174 the preceding year. If from this is deducted the following, which can hardly be charged against the death-rate of the city, viz., old age, ten, still born, twelve, and accidents, three, twenty-five in all, we have 116 or 11 6-10 per thousand of the population, which must be regarded as a substantiation of the fact that St. Catharines is one of the most healthy portions of the continent.

The following table will show the number of infectious and contagious diseases reported to the Board during the year ending November 15th—diphtheria, fifty-four ; scarlet fever, ten ; typhoid, three. The deaths from same diseases reported to the Board being as follows: diphtheria, three ; scarlet fever, one.

Your Board regret to say that they find the burial certificates furnished to the city clerk, shew that two deaths from diphtheria were not reported to the Board by the medical men in attendance, viz., one in October and one in June ; also that one death from scarlet fever in October was not reported.

The Sanitary Inspector has continued to perform his arduous and sometimes rather unpleasant duties to the entire satisfaction of the Board.

The Secretary has also performed the duties of his office in a most efficient manner.

GEO. C. CARLISLE,
Chairman Local Board of Health.

TOWNS.

BARRIE.

Medical Health Officer's Report.

Regarding the health of the Town of Barrie during the present year, there has been very little of the serious epidemic diseases, which are known to be associated with unsanitary surroundings. Although there has been a good deal of typhoid fever in Ontario during the last few months, we have had almost none in Barrie—excepting five or six imported cases—all of those being ill with the disease when they arrived in town.

In my practice there has been no diphtheria, and I have only heard of one case in town. Whooping-cough and measles have been very prevalent, and some cases of mumps were noticed. Some cases of chicken-pox were also found in the schools.

There has been a little malaria and rheumatism, especially in a district of the town which was deficient in drainage; but now, subject to an order from the Local Board of Health, is well drained.

Altogether, I think our town in the matter of health, will compare favourably with any town in the Province of Ontario, and it is the aim of the Local Health Board to keep it in that condition.

W. A. ROSS,
Medical Health Officer.

BOWMANVILLE.

Secretary's Report.

The Town Council of this town appointed a Local Board of Health at the proper time, but no health officer. The Board made an inspection of the town in the spring, and ordered the cleaning up of some yards and closets that required it. Beyond that, nothing has been done. The health of the town has been good all the year.

R. WINDATT,
Secretary.

BRAMPTON.

Secretary's Report.

The Sanitary Inspector has reported to Local Board the work he has done in connection with his duties. He visited 600 premises, and gives sanitary condition of each. He served notices in writing, on those neglecting to observe the proper rules, orders and regulations, and if the notices proved ineffectual, then he enters a suit to compel delinquents to obey the law, in which action the Board sustains him.

There were of diphtheria six cases, no deaths; typhoid eight cases, two deaths.

The Board did not deem it necessary or advisable to appoint a medical health officer, having two medical men on the Board.

The fact is that there was no possibility of making more exertion than that which has been made so as to effect a thorough sanitary state of the town, and, indeed, the inhabitants show much willingness in complying with orders of Board.

JOHN McCULLY,
Secretary to Board.

CHATHAM.

Medical Health Officer's Report.

Sixty-two cases of typhoid fever have occurred, six cases of which proved fatal.

Forty-six cases of diphtheria, five of which proved fatal.

Seven cases of scarlet fever, none of which were fatal; and seventy-three cases of measles, forty-one of which occurred in July; none fatal.

In addition to this there were five cases of whooping-cough and two chicken-pox.

Placarding houses where contagious diseases occurred has been thoroughly and systematically carried out. Much praise is due to the physicians of the town for their cordial co-operation and aid by promptly reporting cases. In this connection I would recommend that the disinfection of houses where contagious diseases occur, be systematically done by an officer of this Board, and not, as at present, be left to the family and attending physician.

Four hundred and eighty-two water-closets were cleaned out through the Inspector's order, besides those cleaned by the citizens of their own option, six wells were also ordered cleaned by him. There are ninety-nine dry earth closets in use, which are cleaned monthly.

I have made the necessary suggestions to the proper authorities as to remedying the unsanitary condition of the county gaol and police station, but they have been acted on in part only so far. The pollution of the river is involved in gaol nuisance, and the purity of the ice supply (which is near that point) threatened. The Marx building nuisance complained of by other tenants was abated, and many other lesser nuisances were investigated by the Inspector and myself and abated.

About the 1st October last, my attention was called to a rumor that most of the cases of typhoid fever occurred in families who received their milk supply from one dairy. I at once commenced an enquiry into the truthfulness of the report by directing the Inspector to visit each house in town where typhoid fever existed, and enquire where the milk used by the family was purchased. Out of the whole number of families afflicted (twenty), with the exception of three who purchased from unregistered parties, the milk was purchased from two dairies, and this directed investigation of the two dairies. On visiting them, I could find nothing to direct suspicion against the cows on the premises; the water for washing the cans, in one case, was procured from the river, in the other from a well, but it was stated that the water was first boiled, and used hot for cleansing the cans, etc. On further enquiry, I learned that one dairyman purchased milk from a man in whose house two cases of typhoid fever occurred and another case was still under treatment.

In the other instance milk was purchased from a man in whose family a case of chronic diarrhoea existed all summer. A greater number of cases were noticed on this man's route than on the route of the first mentioned.

While investigating, I pointed out to the dairymen the great necessity of using only pure water, and scalding out all vessels, etc., and since the investigation only two new cases of typhoid fever occurred. This is a significant fact, when we consider the number of milk vendors in town.

After careful consideration, I am fully convinced that the ice supply is a source of danger to the health of the town, as long as it is permitted to be cut inside or west of the town limits, unless proper precautions be taken against the contamination of the river; but it seems to me manifestly unjust to interfere with a legitimate industry and put its proprietors to great expense and trouble, because a few parties persist in violating the "Health Act" by contaminating the river; so I would recommend that steps be taken to restrain the High School, county gaol, and other parties offending, from emptying excreta into the river. I would indeed recommend as the only remedy that all parties emptying excreta into the river, creek or public sewers, be stopped from so doing. This should not be regarded as a special privilege they enjoy, but as an offence they offer to their fellow citizens.

WM. R. HALL, M.D.,
Medical Health Officer.

COLLINGWOOD.

Secretary's Report.

In compliance with the provisions of the statute I herewith present my report as follows :—

A Board of Health was appointed and organized in the beginning of the year, but have not since met. There has been no outbreak of contagious diseases reported in the town during the year. The sanitary condition of the town is fairly good, considering we have no system of sewerage. There is no regularly appointed Medical Health Officer.

JOHN HOGG,
Secretary.

CORNWALL.

Medical Health Officer's Report.

During the past year your district has been pretty free from contagious diseases in even an endermic form. As far as I can gather there have been in all not more than thirty cases, all told, of diphtheria and which were not of a very malignant form ; the few cases of scarlet fever and measles were altogether isolated cases and were of very mild form. There were in all not more than five or six cases of typhoid fever ; in all these cases the usual sanitary precautions were carried out by the physician in charge. In two instances schools were closed when diphtheria was in the neighbourhood. Some trouble was experienced with the owners of slaughter-houses, due to a combination of stubbornness and difficulty in disposing of the large amount of offal that had accumulated ; the only remedy I can see is in the immediate disinfecting and early removal of the refuse while in small quantities. Farmers would be glad to remove it for manuring purposes. I must congratulate the Board upon the needed reforms you have made during the present year in draining stagnant water, bringing in the dry earth system to replace the old fashioned vaults, bettering the sanitary condition at the schools, etc., thus lessening the threads of disease and limiting its spread. You are also to be congratulated upon the present good sanitary condition of the township, and upon having educated the people up to immediate compliance with your orders without needing the assistance of the law.

H. J. HARRISON, M.D.,
Medical Health Officer.

DUNDAS.

Medical Health Officer's Report

It is now more than three years since a Local Board of Health was organized in this town in accordance with the provisions of the Public Health Act, 1884. Since that time, notwithstanding the occurrence of epidemics of infectious diseases in all directions in the Province there has never been any outbreak of such here. A reference to the previous annual reports of the Medical Health Officer will show that hitherto typhoid fever and some types of malaria have been, with the exception of a few isolated cases, the only fevers from which we have suffered. The record for the past year differs but little from that of former years. Two cases of measles, both occurring in the same house and at the same time, were reported. Of scarlet fever there were also two cases, occurring at different times and in different localities. The source of infection in any of these cases could not be definitely ascertained. There were two cases

of diphtheria, one of the patients being a sailor having come home suffering from the affection. The cause of the other case has not as yet been ascertained. The disease was prevented from spreading any further. Fortunately the number of typhoid cases have been considerably less than last year and no deaths have been reported from it. In view of the hot, dry summer we have had more cases may be looked for should heavy rains occur and cause contamination of the wells by surface water.

The supply of many wells has completely failed owing to the unusual dryness of the season, and these should be regarded with suspicion when water again makes its appearance in them. As regards the reservoir, the supply from which ought to be one of the most important factors affecting the general sanitary condition of the town, although the efforts made to render it more efficient and to obtain a larger quantity of wholesome water for drinking purposes have been partially successful, still, up to the present time, the people of the town have not derived any additional benefit by having services put in their houses, or by the establishment of public fountains from which they could procure a suitable quantity and quality of water for at least domestic purposes.

As usual the Sanitary Inspector has been zealous in the performance of his duties, and probably nothing has been overlooked, so far as he is concerned officially, that might, under existing circumstances, reasonably be done to put the town in the most favourable condition to conserve the public health.

JAMES ROSS, M.D.,
Medical Health Officer.

GALT.

Medical Health Officer's Report.

In making this my annual report for the current year as Medical Health Officer, I have again to congratulate you on the good work done in the past year, and on the comparative freedom our town enjoys from epidemic diseases. In the early part of the year there were a number of cases of diphtheria reported, but in most cases was of a mild character, very few cases having proved fatal. Up to date there have been seventy-four cases of diphtheria, fifteen cases of typhoid fever and four of scarlet fever reported, with four deaths from the former and none from the two latter. During the summer season our town, in common with many others, was visited by an epidemic of dysentery that proved fatal in a few cases. The faculty were unable, in most cases, to give the cause as to where the largest number of fatal cases occurred; the water, when tested, showed no impurities, and the houses were all in a good sanitary condition. At the present time there exists a number of cases of diphtheria, which continues to spread owing to parents allowing their children to attend school while the disease exists in the houses; there should be more stringent means used to overcome this. I would strongly recommend that all houses in which contagious diseases exist be placarded, and in cases where physician or friends neglect to report cases they be dealt with as the Act provides, and I feel satisfied if one or two examples were made there would be no further trouble. It is gratifying to know that the town council are making every effort to secure a supply of good water, and it is to be hoped when the by-law is submitted it will carry by a good majority.

You will observe the few cases of typhoid fever there have been during the year. This, I think, may be accounted for by the careful inspection of wells and the closing of many that were unfit for use. I cannot close this report without expressing my regret that the council is not in a position to grant us a hospital, but live in the hope that some day, not far distant, that either the town, or some large-hearted individual living in it, will immortalize itself by following the example set in Brantford.

G. P. SYLVESTER, M.D.,
Medical Health Officer.

KINCARDINE.

Medical Health Officer's Report.

As health officer of the Town of Kincardine, for 1887, I beg leave to report as follows :—

During the year there has been of enteric, eighteen cases, none fatal ; diarrhoea, fifty-two cases, none fatal ; cholera infantum, four cases, none fatal ; cholera morbus, five cases, none fatal ; measles, twenty-six cases, none fatal ; whooping-cough, thirty cases, three fatal ; diphtheria, one case, not fatal ; intermittent fever, two cases, not fatal ; remittent fever, three cases, not fatal ; erysipelas, four cases, not fatal ; scarletina, two cases, not fatal ; mumps, one case, not fatal.

All of the cases of enteric fever were of a very mild type, and were, some of them, caused by impure water ; some few by using milk from infected house.

The general health of the town has been good.

BENJ. WALDEN, M.D.,
Health Officer.

LINDSAY.

Medical Health Officer's Report

You are legally constituted custodians of the public health, and the duties entrusted to your care in preserving and protecting the public health are very important. Immense strides are being made in sanitary precautions and measures ; the subject in all its varied phases is being intelligently discussed ; look in whatever direction you may, and you find that the best talent is being enlisted ; facts are being developed ; the agencies that favour disease, suffering and death being enquired into, and corrective measures, based on advanced scientific research, applied. As a result, material improvement is noticeable—epidemics that formerly depopulated whole districts are being stayed ; their character becomes less serious, and the death-rate, not only in Europe, but the United States and Canada, lessened.

It is a matter of regret to me, as it must be to your Board generally, that for some time past there does not appear to be that *entente cordiale* between the Municipal Council and your Board, which there should be in the interests of public health, in which you are both interested, and which should be carried out by the co-operation of both bodies in the greatest harmony. During the year important matters have engaged your attention, but receiving very little respect from the Council. I quote from the minutes of your meetings to exemplify this. On July 25th, the following resolution passed unanimously and was read at the Council Board : “That this Board recommend the Council to rent or purchase a lot on which a deep trench should be excavated for the reception of offensive accumulations in the town, and that a notice be put up at the place of such deposit directing all parties making them to cover them over carefully with the earth removed from the excavation, so as to avoid any offensive smells in the neighbourhood.” In the face of the fact that during the month of May previous, your Inspector had reported the presence of scarlet fever and measles throughout the town, that he had placarded thirty-nine houses, and that the merchants and others had really no place to throw such refuse, you would naturally expect that the Council would at once accede to your reasonable request. Such, however, is not the case. They killed by simple neglect. Again, another resolution was formally presented, which received your hearty approval, “That the Board considered that Mr. Hughes had performed the onerous and at times uninviting duties appertaining to the office of sanitary inspector to the satisfaction of the chairman and members of the Board generally ; that the Board considered that to the vigilance of Mr. Hughes may be attributed the fairly good state of the public health during the present unusually hot season, and that this Board recommend that Mr. Hughes be con-

tinued in his present appointment until the end of the current year, and respectfully suggest that the appointment of Sanitary Inspector be made at the same time as the other officials of the corporation are appointed, and that this resolution be forwarded for the consideration of the Council." Yet, without further consultation, the Council saw fit to dismiss this officer, who enjoyed, as your servant, your confidence. As a consequence of this act, the work of your Board was seriously interfered with. Not only is this felt by you, but it is felt outside as well. In the small matter of the fortnightly reports, neglect in their regular collection renders the bulletins issued by the Provincial Board incomplete, and the information intended for general instruction a blank as far as this district is concerned. I trust, indeed, a more happy feeling may be inaugurated, else, discouraged and dispirited, your Board will be without body or soul, without local habitation or name, will cease to exist, and that very shortly. I do not wish in any degree to reflect upon your new inspector; he is not wanting in intelligence. The duties "are, at times, uninviting," and require peculiar tastes and talents, not always associated with high breeding and refinement. In a report by your special committee, the advisability of boring for water on the height of land in the western portion of the town was advocated. I have great hope that the suggestion will be acted upon and that a plentiful supply of good water will be secured. With perfect water and sewerage system we may look for increased immunity from epidemic and endemic diseases in the future, and a uniform high rating of health. A year ago there were only two or three house ventilating with pipes and not one on the front street. During the past year some fifteen have been put up. As a result, complaints of smell from the man-holes of the main sewer, once so frequent and annoying, are now rare indeed. The improved system of sewerage once introduced, storm water will have better means of escape without admixture; and the main drain, once thoroughly flushed, will give little or no trouble. From your unfortunate experience I am the more impressed that your mode of election is not without grave cause of complaint, and that to be thoroughly efficient you should legally have control of necessary public funds. I hope this matter, which I have on every occasion advocated, will receive legislative approval.

P. PALMER BURROWS,
Medical Health Officer.

MEAFORD.

Chairman's Report.

The Board held its first meeting for the year on the 28th of March, 1887.

The only case of sanitary defect brought to the notice of the Board during the year was an open drain in the town, and which was remedied by the Town Council on complaint being made by the Board.

The Board are pleased to be able to report the present sanitary condition of the town as being generally good, and although there have been an unusual number of deaths in the town during the year, none have occurred from contagious diseases or from epidemic

JOHN GROOM,
Chairman.

NAPANEE.

Medical Health Officers' Report.

In accordance with the requirements of "The Public Health Act" of 1884, I beg to submit my annual report as follows:—

Your Health Inspector has, as usual, discharged his duties admirably well during the past year, and the Board has done everything in its power to place the town in as sanitary a condition as it was possible for them to do; yet, notwithstanding all this energy, contagious and infectious diseases have prevailed to an alarming extent, there having been reported since December last no less than thirty-six cases of diphtheria, of which nine had resulted fatally, or twenty-five cent. of the whole number reported. This does not include a large number of cases which have occurred and were arrested in their progress by the attending physician during their early stages, and were, therefore, not reported to the secretary of the Board.

A low form of malarial fever has prevailed to a large extent, assuming, in some instances, a typhoid type. Four cases of typhoid have been reported and one death.

All these cases are correctly classified amongst preventable diseases, and they have undoubtedly had their origin in bad drainage and a deficient supply of pure water for domestic purposes, especially drinking water, and too frequently a total disregard of the ordinary hygienic precautions.

I entered so fully in my report last year of what was necessary to place the town in a sanitary condition, that it is not necessary here to reiterate my former statement, but simply to urge upon the municipal authorities the necessity of carrying out what was then suggested, as soon as the financial condition of the municipality would warrant them so to do.

ALLEN RUTTAN, M.D.,
Medical Health Officer.

NIAGARA FALLS.

Chairman's Report.

In accordance with the statutes in relation to public health, I beg to report that several nuisances have been complained of during the year, principally caused by defective drainage or want of drainage, and where such nuisances have been found to be deleterious to public health, your Board have acted promptly and have remedied the evils.

It is gratifying to be able to report that while contagious diseases have been raging in many towns in Canada, our town has, providentially, been almost free from these scourges.

In the few cases of contagious diseases which have occurred here, the Board of Health have immediately taken action, and have isolated bad cases, in accordance with the statutes and as directed by them. Physicians practising in the town have acknowledged the valuable assistance of the Board of Health in these cases, which has, to a large extent, they say, prevented the spread of disease.

I am happy to report that the general health of the town is good.

I would strongly urge the necessity of more public sewers. In covering the end of Muddy Run Creek the town has secured a most valuable sewer at a trifling outlay. The benefit of this sewer will be felt by three-fourths of the population of the north and centre wards.

I would urge the grave importance of putting in water-closets and the trapping off of sewer gas by those persons who reside, or have places of business on Bridge Street and Erie Avenue. Dr. Reade and I have examined these premises, and we are of the opinion that the sewer there in its present state (being open) breeds sickness, from which the people living on these streets have suffered.

The usual reports have been made, from time to time, to the Provincial Board of Health.

G. H. HOWARD,
Chairman, Board of Health.

ORANGEVILLE.

Medical Health Officer's Report.

Owing to the fact that neither Sanitary Inspector nor Medical Health Officer were re-appointed until the season had considerably advanced, those precautionary measures so necessary were not in the spring of 1887 adopted, and the garbage accumulated during the winter months, had already begun to ferment and pollute the surface soil with its soluble materials before the domiciliary visits of the Inspector were made.

In reference to the most fertile source of typhoid—namely, the accumulation of the contents of privy vaults—it was impossible to do more than order the free use of copperas solutions, dry disinfectants, and the use of absorbents such as ashes and dry earth.

In the total absence of any system of sewerage, and the pollution of well water by animal and vegetable organisms, together with the extraordinary diminution of the water supply, and the consequent concentration of solids contained therein, we find the causes of the increase in cases of malarial and infectious nature which has been apparent during the months of August and September.

Complaint having been lodged concerning the nuisance created by the careless disposal of refuse in and around the egg-packing warehouse, investigation was duly instituted, and such instructions and orders given as were deemed necessary in the case. But, as I have reason to believe, these were evaded to some extent, and the nuisance will assume, with each succeeding season, an aggravated form. I would suggest that the proprietor be in future compelled to remove all waste materials beyond the limits of the town, and bury or cover such filth to a sufficient depth to prevent any emanations therefrom.

I have already insisted on the necessity of cleansing and disinfecting the two races which have contributed in no small degree to the spread of malarial and typhoid types of disease. At the same time, the Board should peremptorily order all drains emptying into these races to be supplied with proper filtering apparatus at their mouths. Moreover, the County Council should be notified that the accumulations from the gaol and court house must be conveyed by tile drains or other proper sewers beyond the limits of the corporation. There is not the shadow of a doubt but that the pollution of the bottom of the waterworks race by the sewage escaping from the county property, and the exposure of the saturated mud to the influence of the air and sun's rays, was productive of at least one case of typhoid fever, and one of diphtheria.

I append a table for the month of August, during which the unsanitary condition of the town reached its height, showing the number of cases of throat and gastro-enteric affections so far as could be ascertained. I was obliged, owing to the continued neglect in reporting cases to the Board, to procure this information by personal application to the medical practitioners. It will be advisable for the Board to enforce in future the compulsory powers vested in them by the Act. In addition, I append two lists of death from typhoid fever and diphtheria from January to September inclusive. The one, as you will observe, is made up from the information given by the undertakers; the other, incomplete and misleading, is derived from the Clerk, who should, if the law were properly observed, have complete and true record of all deaths in the municipality.

In reference to the placarding of houses where infectious diseases are present, I found that attempts at concealment were so successful that no reliance could be placed on such a means of isolation, excepting in the case of those patients under my own personal attendance.

Wherever a rumour has reached me of the presence of infectious or contagious disease in a household, from which were pupils attending our schools, I have invariably notified the teachers and called their attention to the recent amendments giving them power to suspend on suspicion in such instances, and have thereby, I trust, succeeded in preventing such extension of diphtheria as has occurred in other places, involving the closing of schools entirely. In view of the continued presence of contagious skin affections amongst the pupils of the public school, I would strongly urge upon the Board the

advisability of calling the attention of the Trustees to the importance of adopting a system of quarterly inspection.

A severe type of diphtheria has recently shown itself in the case of two families, wherein three deaths occurred. So far as can be ascertained, the cause of the outbreak in each was strictly local.

I enclose a circular issued by the Provincial Board of Health, regarding the inspection of dairies, byres, cheese-factories and creameries, and the licensing of milk vendors, which is of great importance, as it has been proven beyond a doubt that next to impure water, milk constitutes the most frequent vehicle of infection.

The prevalence of diphtheria and typhoid during the present year, and the numerous indications of the arrival of cholera are long, render the adoption of all possible precautionary measures of vital importance. Although the mortality has been comparatively light, it is none the less needful that the predisposing causes of disease should be banished so far as lies within our power. I have already pointed out that another system of water supply than that in existence at present, together with thorough sewerage, are the modes by which a radical change for the better can be brought about.

While here and there a household may take all pains to cleanse and keep clean their premises and their water supply, even going so far as to boil or filter the drinking water, we do not know the moment when some wandering tramp may carry into our midst the seeds of a pestilence which, finding a soil suitable for the rapid propagation thereof, will result in a harvest of death.

I must again urge the importance of obtaining an appropriation from the Council for certain sanitary work which does not fall within the circle of obligations laid upon private citizens. In this connection it is extremely necessary that a more complete inspection from house to house be made, and to this end could not a more liberal allowance be granted to the Inspector? In some places the duties of assessor and inspector are performed by the same individual, who also possesses the powers of a constable, and the plan seems to be a good one.

CHAS. M. SMITH, M.D.,
Medical Health Officer.

OWEN SOUND.

Medical Health Officer's Report.

In the early part of the year nothing of importance required attention. Many minor complaints of nuisances of various kinds have been attended to, and the defects, as far as possible, remedied. Those of a more serious character received the attention required, and in some cases were prohibited.

The committee on the selection of a hospital, presented their report, stating the difficulty of fixing on a location possessing the advantages of isolation, water supply, drainage, etc. Also, dwelling upon the necessity, owing to an increased lake trade, of protecting our town from the possible inroad of an epidemic to which we may at any time be liable.

Many wells are still in use in the more densely populated portion of our town, the closure of which has been recommended, and the parties urged to have the town water taken into their houses. Some of the wells it may become necessary to close should the water still continue offensive, which is due, in some measure, to the dry season and the small quantity of water in the wells.

On the 15th of August a communication was addressed to the Council, calling attention to that portion of the creek which passed under the American Hotel, and expressing the hope that the creek will be filled up, as with the completion of the sewers it will be liable to become a general cesspool of the worst kind, without having the means of either flushing or trapping.

During the latter half of the year our town has again suffered from typhoid, perhaps in the present instance not depending so much upon local causes as upon the epidemic character the disease has assumed, pervading the whole Province, in some cases with

great severity ; we have much reason for gratitude that in this locality the disease, though in some cases severe, has been generally unattended with a fatal termination.

In the spread of infectious diseases, it is to be feared that our milk supply, which is derived from various sources, both within and without the town, may be a ready factor. In 1886, it is known that milk supplied from a house infected with scarlatina, placed the lives of three children in jeopardy ; and during August of the present year report stated that many cases of fever on Hill street might be traceable to a house three miles from town, from which milk was sold while the son lay ill with fever. Under these circumstances, it is worthy of consideration in the interest of all, that a strict surveillance be placed over the milk supply of the town, which is derived from between forty and fifty different sources.

The medical examinations of the town were made at four separate periods since last annual report, and it is gratifying to find that among the children attending the various schools, the cases of communicated skin diseases are gradually on the decrease.

At a meeting of the Local Board of Health held this fall, it was suggested that portions of the Public Health Act bearing directly upon the responsibility of individuals as to the notification of infectious diseases, be selected for the purpose of printing. A committee was appointed for that purpose, and the necessary portions selected, which the committee would recommend to be printed in ~~sheet~~ ^{book} form, with a hint that the sheet be tacked on the wall in a conspicuous place. This is thought more necessary, as important changes have been made in the Act, rendering every householder sending children to school from an infected house liable to a penalty, and requiring that immediate notification be given the head master of the illness of the child in the family with any of the diseases enumerated in the Act. Estimating that there are about 1,500 heads of families in Owen Sound, two thousand (2,000) such sheets might be printed at a cost of about six or seven dollars, distribution would cost a small amount ; but all misapprehension would be removed in regard to the meaning of the Act.

The sections recommended to be printed are sections 46, 49, 54 and 65 of the Public Health Act of 1884, and section 1 with subsections 2 and 3 of the amended Act of 1887.

ALLAN CAMERON, M.D.,
Medical Health Officer.

PARIS.

Medical Health Officer's Report.

The town is to be congratulated on its freedom from infectious diseases, especially from those two which are in themselves an index of the sanitary condition of a place, viz., diphtheria and typhoid fever. Although both of them have prevailed to an alarming extent in many towns and cities of Ontario, our town has had but few cases of either disease, and a large percentage of those had contracted the disease in other localities. The Board held meetings as occasion demanded, and found their recommendations and instructions well followed, as far as private individuals were concerned. The old question of drainage of certain ponds, situated within the corporation limits, came up again, and once more drainage was recommended ; but the Town Council failed to act on the advice of the Board, alleging as a reason that they had made no allowance for such expenditure as would be necessary.

Part of the mill race of the flats was cleaned out in September, the material, on its removal, being disinfected by a sublimate solution. The Sanitary Inspector made house to house visitations early in the summer, and found the condition of things in general satisfactory. Where this was not the case, he left instructions to remedy the evil, and on a second visit found that his instructions had been followed.

J. G. SUTHERLAND,
Medical Health Officer.

PARKDALE.

Medical Health Officer's Report.

Since my election as Medical Health Officer on the 11th May, 1885, I have had both in my official capacity and otherwise, frequent opportunities of witnessing the rapid increase of Parkdale's size and population, and am pleased to report a great improvement in its sanitary condition, due, no doubt, to the prompt and energetic action of the Local Board, when any violation of the Health Act was brought under their notice, thereby causing the immediate removal or suppression of nuisances; and, also, by the educating of the great mass of our people as to the necessity of a knowledge of sanitary laws. The Provincial Board of Health has made marked strides in this direction—the only true way to extinguish epidemic disease.

We must look carefully to our easterly limits, as where the population of Toronto is so dense, and the huddling together of so many inmates in small tenements, we naturally must expect disease in all its forms to linger there, notwithstanding that the city of Toronto has an able medical health officer and a very efficient staff of assistants. Yet it becomes us to be constantly on the alert to repel that which, coming upon us so insidiously, would render many a home in our fair town desolate.

For your information I have herewith compiled a few statistics in connection with the Local Board of Health department: cholera infantum, 10; typhoid fever, 5; croup, inflammatory, 2; diarrhœa, 2.

There were seventy-six deaths from all causes during the year, and I think, taking into consideration our local population (nearly 4,000), and since the advent of increased travelling accommodation, thousands passing almost weekly during the summer months through our midst from other places of residence to the Humber, High Park, and Sunny-side, we can safely congratulate ourselves on the above exhibit.

I would like, as in my last report, to again call the attention of the members of the medical profession practising in Parkdale to Rules Nos. 2 and 3, Section 17, Schedule A, wherein they will perceive they should report to the Local Board of Health, or Medical Health Officer, within twenty-four hours all cases under their treatment in the municipality, such as smallpox, scarlet fever, diphtheria, typhoid fever, or cholera.

Neglecting any of these rules, they leave themselves open to a severe penalty. Besides, it hinders the successful working of the Provincial Board of Health, whose monthly bulletins materially depend on the regularity and accuracy of these reports to fix speedily the district which may be threatened with an epidemic.

The drainage system has been thoroughly enforced during the year and proper connection made with the leading sewers from many houses which were lacking in that accommodation last year. New sewers have been put down on several streets where buildings are rapidly springing up.

Frequent inspections of back yards, lanes and water closets, privies, etc., during the summer; and the scavenger removes all garbage weekly.

Our efficient Sanitary Inspector keeps careful watch over the lanes and highways. Very few complaints have been made in this direction this year.

In the erection of brick houses, large and small, special attention seems to be given by their owners to the conservation of heat, but the important matter of ventilation seems to be entirely overlooked. This gives me occasion to remark that in my observation the ventilation of the houses now erected is very deficient.

Ventilation is a science well worthy of investigation by our people of the present day. Living in close rooms, breathing the same atmosphere over and over again is a prolific source of various diseases.

I would suggest that Rule 6, Sec. 16, Schedule A be strictly enforced.

The privies and water closets in the municipality are well looked after. Dry earth in some and pits in others; they are in the majority of cases regularly and properly cleaned out and disinfected as often as desirable, and whenever a case of neglect, however, crops up, it is immediately looked after by the Sanitary Inspector.

Rule 1, Sec. 69, Schedule A, should be printed and distributed, as it seems to me the general public are not aware of such a clause being in existence.

In the matter of cow-byres and milk-vendors, creameries, etc., in this municipality, I would refer you to a circular just issued by the Provincial Board of Health as to registration, periodical inspection and enquiries in connection with the sale of milk in the municipality. It is well worthy of being acted upon, and for the safety and welfare of the young children especially, would recommend your Board to take immediate action thereon.

The cow-byres reported to your Board so many times during the year, and the frequency of complaints regarding them, makes it advisable that steps be taken for their removal not later than early next spring, frequent inspections to be made of such byres in the meanwhile and reports sent in as to their cleanliness, health of the cows, their diet, etc.

The attention of owners of tenement houses should be drawn to Rule 12, Sec. 69, Schedule A.

Some cases of this kind came to my notice this year when the water supply was insufficient and the owners were careless. There are very few wells in the municipality, and they are, in the majority of cases, outside of the more populated parts.

I would again draw the attention of the Board to the fact that we should have some better and speedier method of getting rid of our garbage than at present exists, more so on account of our increasing population.

I recommended last year that we should adopt the crematory plan at once, which would be of little expense in comparison to its usefulness.

I understand that proper precautions have been and are being taken to remove the difficulty complained of at Sunnyside, which, no doubt, will be a source of much satisfaction to the water takers, and an advantage to the health of this municipality.

J. KNIGHT RIDDALL, M.D.,
Medical Health Officer.

PETERBORO'.

Medical Health Officer's Report.

In presenting the fourth annual report of the Medical Health Officer, I am proud to say that the town, during the past year, shows a lessening death-rate, a freedom from outside epidemics, and a lower ratio of infectious diseases than the majority of towns in the Province. The amount of sanitary work done has been large, and it is only fair to assume that this has contributed to a great extent in producing so gratifying a state of affairs. The principal points demanding our attention are the following :—

SLAUGHTER HOUSES.—Two slaughter houses have been removed outside the town limits during the present season. Frequent inspections of those still remaining have been made, and have shown that a great deal of pains is taken to keep things up to the standard. If an occasional bad odor is found, it is generally from unavoidable rather than from avoidable causes. The infrequency of complaints as to slaughter houses is in marked contrast to the state of things two or three years ago.

HOG PENS.—This year, as in other years, it has been necessary to order the removal of a good many. It often seems a hard step to those who have much kitchen refuse, but the development of scavenging has helped greatly in disposing of the latter. We may hope that before long, within the town limits during the summer, the *genus* hog will be practically extinct.

REMOVAL OF GARBAGE AND EXCRETA.—In no other division of the sanitary work of the year is so much improvement seen as in this. When the first Board of Health was inaugurated it was with difficulty that one man could be got to attend to this work. Now

twelve or fifteen are engaged in it, and as a natural result, it is pretty well done. A lot was obtained at the lower end of the town for the deposit of all kinds of refuse and has been made good use of. Indeed much harmless matter has been put there, that might as well have been used in filling up Spaulding's Bay. Clippings of glass, tin, and zinc, and ashes and such material would answer admirably for that purpose; but the difficulty is that occasionally a dead cat or rat is found in the heap, and, when exposed to putrefactive influences, tells some sensitive nostril that the town is in an alarming unhealthy condition. Hence it has been found advisable to prohibit almost all kinds of refuse from being deposited there.

WELLS.—I have analysed more than seventy samples of water during the present year. As a rule there was less organic matter than heretofore, but some wells were very bad and had to be closed. I should recommend filters to be used in every house. Good and cheap ones can now be easily obtained, and are a great protection from the impurities which find their way into the best water.

COMPLAINTS.—Hundreds have been sent to me throughout the year, the great majority having reference to the throwing of slops by families at their neighbor's doors. A good system of sewerage would, of course, remedy this and the necessity for such a system becomes apparent yearly. A bad state of things is found at the rear of the stores in spring from this cause. Snow accumulates, and, mixed with the slops periodically thrown out, is converted into a mass of ice several feet in thickness, which shaded from the sun, does not melt away till June or July, and makes spring cleaning impossible till then. Complaints as to offensive premises are much less frequent this year, owing, no doubt, to more efficient scavenging. All complaints have been remedied as promptly as possible. Acting-Chief Adams, being the only Inspector on duty during the day, had his hands full, still we managed to get through the work of the year pretty well.

TYPHOID FEVER.—When two or three well known persons are attacked with this disease, the many rumors connected therewith lead the public to suppose that hundreds of cases exist around them. The truth is that in Peterborough this year we have had very little more than our ordinary share of typhoid and much less proportional than many towns in Ontario. An intensely hot July is probably accountable for the slight increase. Three deaths have occurred from typhoid and three from typho-malarial throughout the year.

DIPHTHERIA.—From 1st December, 1886, to 1st December, 1887, eight deaths have occurred from this disease, five of which were in last December. There have been no cases reported during the latter summer and fall, but within the last week or so a few have occurred. The greatest care is taken by means of placarding, isolation and disinfection to prevent any communication. The proportion of cases is a good deal less than in the majority of towns during the year.

SCARLET FEVER.—Very few cases have occurred and only one death.

DEATH RATE.—In 1886 there were 149 deaths to a population of 8,428. In 1887, 144 deaths to a population of 8,663. In other words, last year the death-rate was 17.6 per thousand, while this year it is only 16.6 per thousand, the lowest on record in Peterborough. The registrar-general of England fixed upon 17 per thousand as a kind of standard to be aimed at by sanitarians. In coming below even that, we have much reason for gratification.

MILK SUPPLY.—I have lately received circulars from the Provincial Board referring to this question. It is proposed to take comprehensive measures next year to ensure the purity of so important an article of diet. Your officers notified several of the milk-vendors that their places might soon come under inspection. I may say that no complaints have been made as to impurity of milk sold in the town.

Appended is a synopsis of sanitary work done during the last year.

J. CLARKE, M.D.,
Medical Health Officer.

Synopsis of sanitary work done in Peterborough during the year 1887 :—

Number of yards inspected	523
“ notices served	213
“ yards in good condition	320
“ slaughter houses removed	2
“ hog pens removed	32
“ wells inspected	112
“ samples of water analysed	74
“ complaints	350
“ water closets cleaned	57
“ houses placarded	32

 PICTON.
Medical Health Officers's Report.

I have the honor to present my second annual report on the sanitary condition of this town for the year 1887.

Notwithstanding the efforts of Medical Health Officers, Local Boards of Health and others interested in the promotion of public health, a great deal of opposition is placed in their way by persons either wilfully negligent of or carelessly indifferent to the well-being of the community.

Sanitary work is yet in its infancy, and it is very encouraging to note the decided change for the better in public sentiment in all parts of Canada, and especially in Ontario, during the past five years.

It is not too much to say that within at least the next decade the work of executive health officers will be as explicitly defined and as thoroughly executed as that of our chief magistrates to-day.

No very fatal epidemic has visited our town during the past year; measles and whooping-cough prevailed during the latter winter and spring months, continuing in a sporadic form until now. Ten cases of typhoid fever in the town have come under my notice, directly or indirectly, during the year, all but one occurring within the last three months. Most of the cases were mild and only one death occurred, which, however, was one life lost from a preventible disease.

The late Dr. Parker, of England, once remarked, “When a man dies of typhoid fever some one ought to be hanged.” The existence of this disease in a town or country suggests the advisability of looking more closely to the water supply and the condition of the back yard and its belongings. It is an indisputable fact that typhoid fever and diphtheria are pre-eminently country diseases, and destroy more lives in rural districts and country towns, compared with the population, than in large towns and cities. These results are, undoubtedly, associated with an impure water and milk supply. Ignorant prejudices are, like facts, stubborn things and hard to remove, and frequently nothing but a plague is sufficient to arouse the people to a sense of their danger.

It has been frequently proved that a well drains an extent of ground the shape of an inverted cone, and the area of the ground drained is about four times the depth of the well. This varies with the nature of the soil and the dryness of the season. In a porous soil like ours, after such an unprecedented drought as we have past experienced, it will not be surprising to find the fall rains followed by an outbreak of typhoid fever and other filth diseases through the contamination of well water by soakage from unclean surroundings. The question of water supply has not received the attention it demands in our town, although we are approaching a much better state of things in that direction than existed heretofore.

The Statute enacts that all wells must be cleaned out at least once a year. This law has not been observed save in individual cases, and until all privy vaults and cesspools are cleaned out, filled up, and dry earth closets adopted, the emptying of wells will be prolific of evil, for, as soon as the well is empty, soakage commences to pour in from all

sides, and if there be a cesspool or sewer in the vicinity, the well gets the benefit of its contribution.

In towns where well water is used every precaution against soil contamination by refuse and slops should be taken. Even flowing springs are not proof against this source of impurity, as was instanced in this town during the past summer. The spring, "flowing from a crevice in the rock," and, therefore, "absolutely pure," became dry, ceased to be a spring for the time being. The town sewer was dammed in order to get water to water the streets, and at once this spring began to flow as it had done for generations before.

Picton has accomplished considerable during the past year toward securing a purer water supply.

On recommendation of the Local Board of Health, the Municipal Council passed a by-law practically forbidding the use of privy vaults and cesspools, and enforcing the establishing of dry earth closets; scavengers were appointed to remove night soil, and a fair beginning to this work was made.

During the year some sixty-five vaults were cleaned out, from which over forty tons of night soil were taken. Of these sixty-five vaults only about half were filled up by the scavengers; we presume the occupants filled up the rest according to agreement. Presuming that two hundred dry earth closets were in use prior to the passing of this by-law, there remain at least three hundred vaults yet untouched.

The Sanitary Inspector, whose duty it is to make frequent house-to-house visits during the year and investigate such matters, can give me no information bearing on this point.

I now repeat what I said last year, that before thorough sanitary work will be done there must be a paid sanitary inspector, whose other duties do not conflict with a thorough execution of his work as a health officer. It is to be hoped that Picton will secure the aid of an intelligent man for this purpose, and thus save the lives of many of her citizens and more of their money by the transaction.

The death-rate for this year up to the present is $1\frac{1}{3}$, a little less than the rate last year, which was $1\frac{2}{3}$ per hundred. Printed slips, for reporting cases of contagious diseases to the Secretary of the Board of Health, were supplied to the several physicians of the town, but were not used save in my own case. Fortnightly returns were made to the Secretary of the Provincial Board of Health of all zymotic diseases during the year occurring in the town.

The marsh at the head of the bay is an excellent breeding-place for all malarial and zymotic diseases. This place could be easily drained, and a dirty and dangerous muck-hole thus converted into a healthy and fertile spot.

I hope that the good work of preventing disease may be carried on much more energetically during the coming year.

J. EARLE JENNER, M.D.

Medical Health Officer.

PORT ARTHUR.

Medical Health Officer's Report.

As required by law, I herewith present my health report of the town of Port Arthur for the portion of the year 1887 which has elapsed.

During the whole of the year there has been remarkable freedom from all varieties of disease. No epidemic has visited the town; we have had only one isolated case of diphtheria in ten months, one of typhoid fever, and two very slight cases of scarlatina.

There have been comparatively few cases of really serious illness, and the death-rate for the year, as far as it has gone, will be found to be unusually small.

The causes leading up to such a satisfactory state of things, as compared with two or three years ago, may be enumerated as follows:

(a) Better house accommodation, and in particular the absence of overcrowding, which formerly caused so much of the sickness.

(b) The large fires of last winter, which destroyed four or five blocks of buildings right in the heart of the town and the centre of its overcrowded part. These buildings

have been replaced by much more spacious, healthy and handsome structures, with all desirable conveniences; so that even if fully occupied in future the occupants will find themselves as residents under very much improved conditions. For the time being, too, the empty spaces found by the fires gave lungs, so to speak, to the town and lessened the probabilities of disease.

(c) The better attention paid to the condition of the streets, drains and yards. In the early part of the spring all householders were compelled to clean their yards, cellars, etc. An examination of all streets, cellars and drains was also made by the Medical Health Officer and a report thereon submitted to the Board, on which immediate action was taken. In almost every case the nuisance was promptly abated either by the owner, or, when a matter to be attended to by the town council, by that body. By the first of warm weather there was not a known nuisance existing in the town; and where such have arisen subsequently they have been promptly attended to. In this connection it may be proper to speak of the most efficient manner in which the Municipal Health Inspector has performed his duties, and to whom nearly the whole credit of the present condition of the town is due. In my opinion Chief Nichols has performed his duty in this respect in a most thorough and capable manner.

As yet the people of the town are drinking pretty much the same quality of water which they were using last year. But a good deal of quiet work has been done by the council in the way of providing a system of waterworks; and though there may not yet be much to show as a result, it is well to hasten slowly in such matters, if the causes of delay be merely to ensure a cheap, plentiful and pure supply of drinking water, and to avoid the occurrence of costly and irremediable mistakes through the too hasty adoption of some imperfectly devised scheme.

The twin question of sewerage under the Frontage Act has already been practically and satisfactorily settled for a large and important section of the town by the construction of the Wilson, Cumberland, Park and Pearl streets sewers, which are rapidly approaching completion, and which will prove to be of incalculable benefit to the section of the town interested. Doubtless this enterprise, which is only a part of a well-considered scheme for the whole town, will be extended till all parts of the municipality are similarly benefited.

Here one practical suggestion might be made. No one could have watched the construction of those sewers this fall without being aware of the odour arising from the excavations, caused by the exposure to the air of decayed wood and vegetable matter. These excavations were begun after the cool weather set in, but had they been commenced in June or July I am satisfied that we should have had a terrific epidemic of diphtheria, typhoid fever, or other such disease along the course of these drains. Should there be any extension next year no such work should be allowed before the middle of August, unless where the soil is known to be sandy or gravelly. And any repairs to the streets which may necessitate the turning up of such soil in smaller quantities should be done quite early in spring for the same reason, and should not be left off till midsummer.

Up to the evening of November 15th, 1887, sixty-one deaths have been registered at the office of the town clerk, and I have reason to believe that all deaths occurring during the year in the town have been faithfully recorded. But of this number more than one-third represent deaths which occurred outside the town, which were recorded here only for purpose of burial. To represent fairly the health of the town we should deduct the following deaths:

Deaths occurring at Rabbit Mountain.....	2
“ Beaver Mountain.....	3
“ in Oliver Township.....	2
“ at Fort William	1
“ Peninsula Harbor.....	1
“ Verte Island	1
“ on Canadian Pacific Railway	11
Total.....	21

This leaves forty deaths as actually occurring during the time specified, and really occurring in the town, including also all deaths at the hospital. But a still further deduction may be made since two patients admitted during the year were moribund on their arrival, so that their deaths should be fairly excluded, leaving the net death-roll at thirty-eight for the ten and a half months. Should the same ratio of deaths be maintained up to the end of the year, the death-rate of the town for 1887 would be in the immediate neighborhood of twelve-and-a-quarter to the thousand of population, which may be looked upon as an exceedingly low rate.

The total number of births cannot be so accurately estimated ; but it cannot fall short of one hundred for the portion of the year which has already elapsed.

During the summer of 1887 I inspected over eighty cows, the owners of which sold milk, and found them kept in a clean and healthy condition. I also examined many samples of the milk offered for sale and in only one instance did I find a sediment, showing that through carelessness in milking some dirt got mixed up with it. In all other instances the milk was up to standard quality and bore no indications of having been made acquainted with the river or the creek.

THOS. S. T. SMELLIE, M.D.,
Medical Health Officer.

ST. MARY'S.

Medical Health Officer's Report.

In submitting this my first annual report to you respecting the sanitary condition of the town, I am happy to be able to state that during the past summer our citizens have appreciated a freedom from contagious diseases that many other places cannot boast of.

In the early part of the season there were a good many cases of measles in the town and country, and although many of them were very ill it is very pleasing to note that recovery was the rule, even amongst the adults who had contracted the disease.

Since January last there were reported to the Secretary twenty-three cases of diphtheria, four of which, unfortunately, proved fatal. There has only been one of these in town since the beginning of last May ; the others were all before that time, although there were about a dozen cases just outside of the municipality during the summer with three deaths.

There were only four cases of typhoid fever, all of which recovered. Of the other contagious diseases, such as smallpox, scarlatina, cholera, etc., none made their appearance amongst us.

It is gratifying to learn from the Inspector that the people of the town are beginning to realize more fully the advantages likely to ensue from the keeping of their premises in a good and healthy condition, as he reported after his house to house inspection last spring a marked improvement over last year ; but there are a great many who seem still to know little or care less as to the sanitary condition of their own or their neighbours' premises, and it would only be when an epidemic broke in upon them that they would wake up to the responsibility of their position. However, it takes time to educate people in sanitary science as well as in other matters, even if it is for their own benefit.

There are one or two matters to which I would most respectfully direct the attention of the Board of Health, and the first is to the condition of the sewer on Water and Queen Streets.

When the weather is very warm and a south-west wind blowing, the odor from the mouth of the sewer is almost unbearable, and why the people living in this locality should be compelled year after year to suffer in this way, I cannot understand, more particularly when it is quite possible to remedy it to a large extent if not altogether.

The sewer should be used only for the purposes for which it was intended, viz., to drain cellars and carry away the surface water of the streets, and parties using it for any-

thing else should be compelled to stop doing so. It is a very strange commentary on our consistency to ask our citizens to clean up their back yards, etc., at a certain season of the year and have the filthiest place in town on the main streets.

I would further direct the attention of the Board to the sanitary conditions of the surrounding of "The Old Lock-up School" in the south ward. In that vicinity stone was quarried out many years ago and excavations left, the depth of which is several feet below the bed of the river, and during the whole of the past summer (and I have no doubt other summers also) there have been decaying vegetable matter and perhaps animal matter too lying in them and partially covered by stagnant water. As there was a number of cases of diphtheria in that locality last autumn and winter, there is not the slightest doubt in my mind as to this state of affairs helping to make the matters worse than they would have been had the sanitary conditions been different. I may add still further, that several of these cases proved fatal, and in the light of experience I consider it would be criminal to have children attend that school and nothing done in the way of putting the surroundings in a good healthy condition.

There has been a good deal of complaint as to the condition of the privies at the Central School. The privy-pit is still used, and as long as such is the case it ought to be disinfected during the warm months of the year, which has, I understand, been done, and the excreta removed at least once a year, which has not been done for many years. I would most respectfully refer the members of the Board to Sec. 69, clause 14, Rule 3 of the Ontario Health Act, for their guidance in this important matter. The conditions of the Act ought to be strictly carried out, more especially as there were several fatal cases of diphtheria in that locality last winter.

In a town like this, where we have no water works, and may not have any for many years, the dry earth closet system ought to be introduced as rapidly as possible, and although there might be a little more trouble and expense in connection with such a system than with the present one, still we would all feel that we were more than repaid by our being in a better condition to resist contagious diseases.

Some difficulty has been experienced in obtaining a suitable place for the depositing of filth of different kinds, and the want of such a place has been made the basis of an excuse by some for not cleaning their premises at all.

The Board should see to it that arrangements are made for the necessities of the town in that direction.

JOHN SINCLAIR, M.D.,
Medical Health Officer.

SAULT STE. MARIE.

Secretary's Report.

I have the honour to inform you herewith that the Medical Health Officer and the Sanitary Inspector for this town have made their annual reports for the current year, of which the following is a brief summary:—

"That the town is in a highly satisfactory condition when viewed from a sanitary standpoint.

"It is recommended that the town procure a water supply from some other and purer source. Also it was recommended that Council pass a by-law rendering compulsory the dry earth closet system instead of the present pit system, the old time usages to be disinfected and filled up, and superseded by the dry earth system; such to come into operation on and after May 1st, 1888.

"The appointment of a town scavenger is recommended, and the procuring of an isolated place, easy of access, for the dumping of garbage and night soil, so that when mixed with soil or chemical ingredients, it might be used for manure.

"The Sanitary Inspector made a house to house inspection, causing the removal of all refuse matter or whatever could be detrimental to the sanitary condition of the town.

"In conclusion, I will say we have been free this year from any epidemic or infectious disease dangerous to the public health."

CHAS. P. BROWN,
Secretary Board of Health.

STRATHROY.

Medical Health Officer's Report.

In compliance with the regulations of the Health Act, I now beg leave to submit to you my report for the current year. It affords me much pleasure to be able to state that the sanitary condition of the town for the past year has been remarkably good. While some of the cities and towns of the province have been visited with epidemics of typhoid fever, diphtheria, etc., we have been comparatively free so far from these diseases. During the year some few cases have occurred, but none of a malignant type have been reported. There have also been some scattering cases of measles and scarlet fever, generally recovering.

Our sanitary inspector made his visits as usual from house to house in the early part of the season to see that all refuse and garbage were removed from yards, privies, etc., to places selected for further disposal, where they would not be considered a nuisance. No complaints were thus far made, so that the place selected by your Board was this season a success. The refuse from the tannery and woollen factory caused some annoyance, especially to those living in the immediate vicinity. It will be well for the Board to ascertain in what way this grievance may be best overcome during the ensuing year.

I have to-day received a communication from the secretary of the Provincial Board of Health, stating that in order to prevent the spread of infectious diseases by the use of impure milk, all dairymen and milk vendors will require to register with the secretary of the Board of Health at least once a year, giving at the same time the sources of their milk supply, the number of cows kept, the food and water with which they are supplied, and also will be required to give notice of any cases of contagious diseases of animals affecting any of those he has in charge; and that the milk supplied be of a proper standard quality.

A great improvement has taken place by the introduction, through our sanitary inspector, of dry earth closets in connection with the Public Schools.

The members of the Board of Health have, as in the past, discharged their duties faithfully and well, and deserve great credit for their untiring energy in the discharge of the work imposed on them by the regulations of the Health Act.

G. HENDERSON, M.D.,
Medical Health Officer.

TRENTON.

Medical Health Officer's Report.

I have the honour to lay before you my fourth annual report. In the two last the occurrence of smallpox with its attendant commercial disturbance, expense and danger had to be chronicled, but happily the scourge has not visited us this year. We have had, however, a very severe epidemic of measles extending over three months, from March to June, with a heavy mortality among children, especially in the ill-drained portions of the town, followed in July and August by an equally heavy mortality from cholera infantum, also most severe in the same unfavourable situations, and among infants nourished on artificial food. No notice was received of the outbreak of measles till several cases in different families were reported from school. An attempt was then

made to isolate the cases, and attendance of children from infected families was prohibited. Soon, however, the teachers and their families were attacked, and the disease became so general that the schools were continued and all who were well enough allowed to attend. To a failure to report the first case is no doubt chargeable the evil of its general prevalence. Last year the first case—imported from a neighbouring town—occurred in my own practice, and early prompt measures cut short the outbreak with scarcely any loss of life. In one of the families, where all who were attacked died, the pernicious habit of throwing the kitchen slops at the front door, where under the heat of the sun it emitted a disagreeable odor laden with disease germs, assisted, if it did not cause, the fatal issue.

In the district known as the French village the few inches of soil which covers the flat rock are actually not above the high water of the river, and the drains—where any exist—only empty slowly as the river falls in hot weather. The mouths are not large nor kept sufficiently cleaned, and a few inches of water remain supporting rank vegetation which, during the season of drouth, dies and exhales a disagreeable and dangerous miasma. The only remedy that suggests itself is to fill up the locality with absorbent earth or gravel, and keep the outlets of the drains free and deep. A little expenditure in this direction would improve the value of property and save many lives. The dry earth closet should be made compulsory and drinking well water prohibited. The dry earth system is very slow in being introduced notwithstanding its urgent necessity. There is a case of a number of stores with tenements in the upper flats on Ridgway and Murphy streets, where all the available space is occupied by the building, and only enough room for a small privy near one of the front doors left. The dry earth system was made compulsory by the Board but was practically avoided, though the landlord made every effort to assist the Health Inspector. The kitchen slops and housemaid's pails are continually emptied on the street, to the great annoyance and danger of the neighbourhood. The Board of Health recommended the street committee to construct a drain from the premises to the bay, but so far the matter has not received their attention. Notwithstanding these facts a more general cleaning up of vaults and yards has been made than heretofore, and a more progressive spirit animates the people, and the efforts of the Board are bearing fruit. The mere fact that the evils are known and pointed out by the Health Inspector has its effect in arousing the populace to a sense of duty. In many places on both sides of the river, on the "flats" filling in will have to be practiced, but a deepening of the drains to low water level will have to be undertaken in order to get entirely rid of surface-water. Along the course of the little streams leading from the mountain each householder constructs a dam, penning the water so that a pail may be dipped up, and retarding the free flow. This should not be tolerated. The same purpose would be served by each making an excavation lower than the bottom of the drain. The barrels which supply the streets had once lids to protect them from dust and other impurities. These have disappeared, parties using the water being too careless in handling or replacing them, so that dogs and other animals have access to them, and dirty pails from stables and outhouses are freely used in drawing the water, thus endangering its purity. From the report of Health Inspector Hinde, which I enclose herewith, it will be seen that a thorough inspection of yards, etc., has been made; also food and provisions offered for sale at the market were duly watched, and three cases brought before the police magistrate and fined for offering bad meat and butter for sale, also one for offering diseased potatoes. Fifty pigs were found within the limits of the corporation—all but three persons complied with the regulation, distance, etc.

Sixty unclean privies were abated and one hundred filthy yards cleaned to the Inspector's satisfaction. The inefficient draining is much complained of, as well as the habit of throwing the slops at the back door—the winter's accumulation melted under a hot sun presents a disgusting spectacle. He reports that on the whole, while he has been more exacting, the people have, when notified, been quite willing to comply with the law.

CHARLES McLELLAN,
Medical Health Officer.

WHITBY.

Medical Health Officer's Report.

As Medical Health Officer of the Town of Whitby for the year 1887, I have the honour to report as follows :—

In compliance with a resolution passed by the Board a house to house inspection was made by the Sanitary Inspector, and where a nuisance, or anything likely to create a nuisance, was found to exist the Inspector gave orders to have the same abated or removed forthwith. In most cases the orders were fairly responded to. If not responded to in a given time the Inspector reported to the Secretary, when a notice was immediately served on the persons failing to comply with the orders.

This had the desired effect—stables and yards were cleaned, water closets emptied and disinfected, and other nuisances, such as manure heaps, decaying vegetable matter, kitchen refuse and dead animals removed.

There have been a few cases of scarlet fever, which appear to have been of a comparatively mild type, only one case having been reported to the Secretary, which did not prove fatal.

Diphtheria was prevalent during the summer and fall, and was traceable to certain localities where the drainage was imperfect or sanitary measures not properly carried out.

Ten deaths from diphtheria have thus far been reported.

Complaint having been made by the Rev. Mr. Hare, Principal of the Ontario Ladies' College, of an open drain passing near that institution, the Board of Health submitted the matter to the Town Council.

The Town Council has ordered the construction of a tile drain from the north to a point south of the college, which, when completed, will improve the condition of things in that locality, and will form a portion of a system of drainage for that part of the town, which is much needed.

The precautions taken by the Board for checking the spread of contagious diseases were set forth in a letter adopted by the Board at a meeting held on the 31st October last, a copy of which the secretary was instructed to forward to you.

I have further to report that since the meeting of the Board of the 31st October, two hundred copies of pamphlet No. 15 have been procured for distribution.

I cannot close this report without recommending that measures should be taken for doing away with privy vaults and substituting dry earth closets instead.

D. P. BOGART, M.D.,
Medical Health Officer.

WINDSOR.

Medical Health Officer's Report.

The season has again arrived when I am required by the health by-law to report on the sanitary condition of the town, and the work performed during the year.

The people of Windsor have again much to be thankful for, at the small number of zymotic or germ diseases that have occurred during the year.

An epidemic of measles swept over the town in the early part of the year, but it was of a very mild type. Typhoid and typho-malarial fever are not reported to the board, but the town clerk and statistical officer has had only three deaths from these diseases reported during the year.

Windsor being supplied exclusively with river water has escaped, while other towns and cities all over the Dominion have suffered severely owing to the dryness of the season causing low water in the wells. These facts seem to strengthen the theory that seven-

tenths of typhoid disease is caused by bad water. As the drainage of the town progresses, what are known as malarial diseases have greatly decreased.

The usual annual cleaning up of the town was begun on the 5th day of May and finished on the 31st day of that month, at a cost of \$124.65.

Copperas and sulphur are still supplied from the town hall at cost price, but purchasers were notably fewer this year than last.

Along with the large number of new buildings erected this year, there has been a noticeable improvement of old ones in the way of raising houses higher off the ground and of filling up under others, doing away with much dampness. A great deal remains to be done in this direction.

During the coming year I intend calling public attention to some points in connection with the water supply, which may involve a considerable expenditure of money. The steady growth of Walkerville and the very complete system of sewerage being adopted there, emptying as it does a large amount of filth into the river above our water intake, would seem to warrant some action on our part to guard against danger which may become serious.

I congratulate the present council on having added a liberal quota to the sewers this year, and for having extended the water mains to parts of the town where the inhabitants have suffered greatly for want of good water. I would strongly urge that parties be compelled to make connection with sewers; and no one should be allowed to empty slops and other offensive liquids from their premises into the public highways, as the council has ample powers to prevent it.

Simultaneously with this I would recommend the abolition of all privy vaults, and where connections cannot be made with sewers, the adoption of the tub system. It is healthier, cleaner and cheaper than the present one, and when people once get accustomed to it, it will be found much more convenient.

I would suggest to the incoming council the propriety of constructing sewers on McDougall Street, and on Dougall, Janet and Caron Avenues. There is a swamp on Dougall Avenue near Elliott Street, extending east and west. I have repeatedly called attention to it, but so far no steps have been taken to drain it. It cannot be reached at present by a sewer, but the council has ample power to compel owners of land to open up and keep open the water-courses.

The crowded condition of the public schools calls loudly for further school accommodation. The condition of the high school particularly demands the immediate construction of a new one or removal to interim premises, as teachers and pupils are suffering from the unsanitary condition of the building. In the erection of the new one, I sincerely trust that due regard will be had not only to location, but also to construction, including air space, admission of light, school desks, gymnastics, ventilation, heating and sewerage.

In conclusion, let me thank the council for the appointment of an engineer to devise means to abate the sewer gas nuisance, and the systematic cleaning up of the premises situated on what is facetiously known as "Consumption Alley."

JNO. COVENTRY, M.D.,
Medical Health Officer.

WOODSTOCK.

Medical Health Officer's Report.

I congratulate you on your very efficient Board of Health, also on your selection of Mr. Baldwin as Health Inspector, Mr. Hall, chairman, and the other members of the Board, having given the Inspector and your Medical Health Officer a great deal of assistance.

I believe more real sanitary work has been done during the present year than in all former years since a Board of Health was established.

The Inspector has made a house-to-house inspection, examining the out houses, wells, etc., connected therewith, and where anything appeared detrimental to the public health he has judiciously ordered its removal, and I am glad to inform you that, with two or three exceptions, the citizens have supported him. I cannot congratulate you on the exceptionally healthy condition of the town during the year, there having been a number of cases of typhoid and malarial fevers, diphtheria, and at present an epidemic of measles. Yet I am pleased to inform you that the death-rate has been low compared with other towns of like size, as shown by the mortuary returns.

In all cases of sickness or death reported to me, I made a careful investigation as to the causes, and am fully persuaded that bad water, sewer gas and marshy effluvia were the chief factors in the three first mentioned diseases.

It is needless for me to remind you of the injurious effects of bad water and sewer gas. The water supply of Woodstock was supposed to be of the first quality. I am sorry to inform you, however, that a very large proportion of our wells, especially in the thickly populated parts of the town, during the present year have been bad. I have examined upwards of 100 wells and fully 75 per cent. were bad, many of them quite unfit for use. I have no doubt if the wells outside the thickly populated parts were properly cleaned once or twice a year and properly protected, a fairly good supply of water could be obtained. But in the more thickly populated parts it will be impossible to obtain good water, as the soil has already, for want of proper sanitary precautions, become so impregnated with poisonous material as to render water percolating through such soil unfit for use.

With regard to sewer gas, so long as the sewer is used for receiving night soil, etc., more especially as it is seldom flushed, you may expect disease and death resulting therefrom.

I would recommend the frequent flushing of the sewer.

I made two inspections of milk sold in town, one in March and the other to-day, and found the milk good. To-day's milk was very good, none containing less than $4\frac{1}{4}$ per cent. fat.

Last June I visited the public schools and premises, made suggestions as to greater ventilation, also as to the use of the dry earth system, which suggestions, I am glad to inform you, the School Board adopted at once.

I again congratulate you on passing a by-law for the adoption of the dry earth system, covering most parts of the town. The Inspector informs me that 68 pits have been emptied and filled up and the dry earth closet used instead. I feel assured that before one year the old privy pits will be a thing of the past in our town.

In conclusion, I would remind you that the work of the Board and your health officers is no light and pleasant task, and it would be in the interest of the town to grant greater remuneration for the work done. Especially would I recommend that Mr. Baldwin get a greater salary, as \$100 is not half pay for the work performed.

ARCHIBALD McLAY, M.D.,
Medical Health Officer.

VILLAGES.

ALLISTON.

Medical Health Officer's Report.

I have the honour to report a good condition of health throughout the municipality. No epidemic of a contagious or infectious character has existed to my knowledge since my appointment, with the exception of measles, and they were of a mild type with no deaths. Nor have any complaints been made to me regarding sanitary matters by the other medical men of this municipality. Doubtless there are many things which require the attention of the Sanitary Inspector in the municipality, but owing to want of information among the people they have not been brought under my notice.

I can, therefore, only report an excellent condition of general good health in the municipality.

T. M. ARMSTRONG, M.D.,
Medical Health Officer.

ARKONA.

Medical Health Officer's Report.

Early last spring an inspection of all premises in the village was made by the Sanitary Inspector, and wherever anything unsanitary existed it was removed.

There have been no epidemic nor contagious diseases during the past year.

The village is now in a good sanitary condition.

W. J. TEASDALL, M.D.,
Medical Health Officer.

BATH.

Medical Health Officer's Report.

I have the honour to report that the health of the municipality has been exceptionally favourable this year. We have been visited neither with diphtheria, typhoid fever, nor other serious contagious disease.

It is to be hoped that this has, in a measure, been due to the precautionary measures which have been carried out.

The usual steps were taken in the early part of the year to place the premises of the residents of the village in a proper sanitary condition. Drainage was duly inquired into and made efficient. The slaughter houses were changed from their original sites to remote and isolated quarters, and the owners required to make a proper disposition of the offal. Your Board are to be congratulated on the favourable results of their efforts this season, and may feel encouraged to proceed in their work for the future with watchful diligence in the lines which have guided them in the past year.

R. KENNEDY, M.D.,
Medical Health Officer.

BELLE RIVER.

Medical Health Officer's Report.

As Medical Health Officer of the village of Belle River, I am pleased to report that during the year the sanitary conditions of the village have been good.

It is a matter of thankfulness that during the past year our village has not been visited by any diphtheria or any other widespread cause of mortality beyond the ordinary causes that are at work from year to year, over which we have no control. There was one case of typhoid fever which was fatal, but it had nothing to do with the sanitary condition of the village as the man was ill when he came here.

U. GABOURY, M.D.,
Medical Health Officer.

BLYTHE.

Medical Health Officer's Report.

I have the honour to report, in conformity with the provisions of the Health Act of 1884, that the general health of our village has been fairly good during the past year, and that with one exception (which was immediately abated upon proper action being taken) no nuisances have been complained of. We have had no serious epidemics of disease requiring public interference, and that no difficulties have arisen in carrying out the provisions of the Acts relating to public health. The epidemic of dysentery which visited us in the summer was of a mild character, and the same may be said of the present attack of measles. There have been a few cases of typhoid and diphtheria of a sporadic character and not spreading beyond the premises where they originated. Scarlatina was imported, but by prompt isolation and disinfection it was confined to one family.

W. SLOAN, M.D.,
Health Officer, Blyth.

BOLTON.

Secretary's Report.

I beg leave to submit for your consideration the annual report as required by the Public Health Act, 1884.

Early in April of the present year I notified the butchers in the village relating to the required sanitary conditions of their slaughter-houses and premises connected therewith, under the rules adopted by your Board for their guidance.

On the 16th day of May I made my first visit to see if these rules had been complied with, and found, with the exception of one of said butchers, that their slaughter-houses and premises were clean and no offensive odour arising therefrom. In this exceptional case I ordered an immediate removal of the cause of offence. June 1st I made a second visit. In this exceptional case I found that my instructions had not been fully complied with, but I am pleased to report that since then all said houses and premises have been kept reasonably clean.

During the months of May and June I made a general inspection of the village and requested that anything offensive or unsanitary be removed and, where necessary, disinfected.

Manure heaps accumulated during the winter months; pig styes, dead animals were ordered to be removed.

On those premises where only a partial removal had been made, the parties connected therewith were warned that if the immediate removal of all such offensive matter was not attended to at once, they would be fined. The parties so offending complied with my instructions forthwith.

I am pleased to report that only one case of an infectious disease was reported to me—diphtheria. In this case the patient was so isolated and kept so that no similar case occurred in the municipality.

SAMUEL A. WALFORD,
Secretary and Sanitary Inspector.

BOTHWELL.

Secretary's Report.

Everything has progressed favorably with the Local Board here. Have had but two cases of typhoid fever in a remote part of the town, and no deaths. No cases of diphtheria at all, but a few mild cases of diphtheritic croup, with one death.

WM. M'ALPINE,
Secretary.

BRACEBRIDGE.

Chairman's Report.

I have to report that there were twenty-five cases of diphtheria reported to this Board during the year, of which seven cases proved fatal.

In addition to these there were undoubtedly other cases of the same disease in families subsequent to the first case reported, which were not reported to this Board.

Typhoid fever was in one family in the village during the month of June last; all cases happily recovered.

During the past year the Board has been unusually vigilant in looking after the health of the inhabitants of the village. A larger amount has been expended by the municipality in draining low lots, in addition to the draining of cellars by the owners of property in the village, than has been heretofore expended in any year since the Public Health Act came into force.

The health of the inhabitants of the village being a primary consideration, I would suggest to the council of 1888 the necessity of appointing a Board who will in this department look after the interests of the village, and trust that the year upon which we have entered may, not only as regards the public health but in all other respects, be a prosperous and happy new year to the municipality.

WILLIAM KIRK,
Chairman.

BRUSSELS.

Medical Health Officer's Report.

The Board of Health during the present year held occasional meetings at the call of the Secretary. Your Sanitary Inspector made a careful inspection in the early spring, and his requests were, as a rule, cheerfully attended to.

The chief complaint during summer arose from pollution of wells, decaying manure and piggeries. As these complaints were mostly verified by inspection of some member

of the Board, it was ordered that the Health Act be enforced. The only miasmatic and contagious diseases reported to the Board were typhoid fever and measles; the latter prevailed very extensively in the surrounding municipalities, but the disease being of a mild type it was not deemed desirable to attempt isolation of the cases. No death from this disease was reported. Only a few typhoid fever cases were reported and no death.

The general health of Brussels is and has been good, notwithstanding the unusually hot dry summer and scarcity of water especially in the southern part of the village.

T. G. HOLMES, M.D.,
Medical Health Officer.

CHESLEY.

Secretary's Report.

In accordance with Section 24, Public Health Act of 1884, I beg leave to report as follows: A full Board was appointed in January last; a Sanitary Inspector was appointed, also a Medical Health Officer. The Board on the 5th instant (being the only meeting since January 31st last, as per statute) reported "no contagious diseases;" the Sanitary Inspector gave same deliverance. The Medical Health Officer attributed in his report our freedom from contagious scourges to pure water and good drainage.

JOSEPH K. CLARKE,
Secretary.

DRESDEN.

Chairman's Report.

It is gratifying to me as Chairman of the Local Board of Health for the current year to be able to report so favourably on the sanitary condition of your town.

We have had but four cases of contagious diseases during the year to this date.

I think I may reasonably conclude that the efficiency of our Inspector, and the willingness of the inhabitants generally to attend to sanitary matters when desired, have in great part been the cause of our surprising freedom from contagious diseases, when some of our neighbouring municipalities are reported to have been severely visited.

We have no Medical Health Officer, consequently cannot lay before you his report.

R. P. WRIGHT,
Chairman.

DUNNVILLE.

Secretary's Report.

Owing to the apathy of our council in not passing a by-law to do away with privy vaults and cesspools, a very large proportion of the wells are more or less polluted from that source, and if the theory advanced by some sanitarians be correct, that a well drains a surface of about four times its depth, there are very few clean wells in this locality. After a careful test of a number of wells, we found nearly all to be surface water, with quite a quantity of foul vegetable matter. Although we did not order any filled up, yet we were strongly inclined to do so; but our medical adviser not feeling disposed to assist, we, as laymen, did not feel like forcing the full limit of the law, more especially as at our request we found the persons interested willing to boil the water for drinking purposes, and willing to clean the wells and carry out the wishes of the board when requested to

do so. Diphtheria entered our village from the Townships of Moulton and Sherbrooke. In the former township more especially this disease was very prevalent; I am informed there were at one time sixty cases, and in some instances three and four out of one house fell as a warning. The disease got a great hold before the Township Boards awoke to the necessity of taking strong measures to eradicate it. Our board had in contemplation the advisability of a quarantine, and ordered me to proceed to the Secretary of the Moulton Board and inform him of the opinion of the Dunnville Board; but I am glad to say they went immediately to work with fumigating and disinfecting, and the change was wonderful. In a very few days the disease began to disappear and was finally conquered. This instance alone should convince people that diphtheria can be confined and largely prevented. Although it raged in those townships and daily intercourse with the infected were kept up, yet our village had but two deaths. I give you a table shewing the number and dates the disease was reported :

May	26th.....	3 cases in one house, one died same day.
May	26th.....	3 " " all recovered; those were 1 mile apart.
August	19th.....	1 " " "
September	2nd.....	1 " " "
"	16th.....	1 " " "
"	27th.....	4 cases in one house, in charge of a medical man who did not believe in any precautionary measures.
October	19th.....	1 case; died October 23rd.
"	26th.....	1 " Recovered.
"	27th.....	1 " "
November	2nd.....	3 " "
"	12th.....	1 " "
"	14th.....	2 " since which date none reported.
Total 22 cases and 2 deaths.		

The total deaths in this municipality from all causes were 34, divided as follows :—paralysis, 1; consumption, 12; convulsion, 1; general debility, 1; inflammation, 5; typhoid pneumonia, 1; drowned, 1; brain fever, 1; diphtheria, 2; poison, 1; cancer, 1; liver complaint, 1; heart disease, 1; old age, 1; dropsy, 2; diarrhoea, 1; infant cholera, 1; gravel, 1; total 34.

On April 5th the board made the first round of a house to house inspection, in each case keeping a record of the condition of all premises requiring attention, and at once notified the occupants to remove the objectionable matter. We also put up posters throughout the village calling attention to the Public Health Act, and quoting the by-law in that behalf demanding that all premises be put in a sanitary condition not later than May 15th.

On our first round April 5th, we found 19 privy vaults, 60 back yards, 39 manure heaps, 8 hog pens and 1 well requiring attention. Our inspection resulted in the removal and cleaning of 74 back yards, 42 privies, 50 stable manure heaps, 14 hog pens, 2 foul cellars and 1 well. We also on October 26th, 27th and 28th fumigated and disinfected the high and public school buildings. I am happy to state our village is now in a fair sanitary condition and free from contagious disease.

J. W. HOLMES,
Secretary.

EMBRO.

Medical Health Officer's Report.

The village was visited during 1887 with epidemics of whooping-cough, scarlatina, diphtheria and measles. The first was conveyed into the municipality and spread over its entire area before its presence was known to the health authorities or its nature known

to the parents of the children attacked, consequently no attempt was made at isolation. Scarlatina was conveyed into the village by three distinct contagions—two of a virulent type. By a rigid system of isolation its progress was arrested on each occasion, but not before two fatal cases occurred.

There were two cases of diphtheria and one of measles, none fatal. All the above were traceable to direct contagion.

The Board has adopted strict sanitary regulations, ordered the clearing of back yards and lanes, the cleaning of wells and disinfection of privies, and has a very efficient sanitary inspector. The "Dry-Earth System" of disinfection has been found so effective—so superior to the chemical modes formerly employed that, from being optional, it is to be made compulsory during 1888.

The only really unsanitary object in the whole municipality is a slaughter house fronting the principal street on the west side, and which has been an "eyesore" to the "nostrils" of everybody during the past summer, as well as a source of serious danger had infectious disease appeared. Though the owner was fined for maintaining a nuisance, still the slaughter house has not yet been removed and may yet cause trouble.

J. ROSS, M.D.,
Medical Health Officer.

EXETER.

Chairman's Report.

The Board of Health for the Village of Exeter for the year 1887, beg to report to your department as follows:—

The Board organized in January. The medical health officer reports the health of the people and sanitary condition of village to be fairly good.

During the year there was reported the following cases of disease: Typhoid fever, five cases, two deaths; measles, five cases, all recovered.

J. A. ROLLINS,
Chairman.

FERGUS.

Medical Health Officer's Report.

I have the honour of submitting my third annual report as medical health officer. It affords me pleasure to be able to say that the health of the village has been, as usual, very good. We have been free from diphtheria, scarlet fever and all particularly contagious or infectious diseases, due to a want of sanitary precautions in many cases. True, we have had several cases of typhoid fever, three of which proved fatal; but the cases have been scattered and not traceable to any cause requiring attention from the Board of Health. There has been more or less typhoid all over the Province due, in all probability, to the hot dry summer and fall and a consequent scarcity of pure drinking water.

Complaints to the Board during the season have been very few and of a minor nature, and these have been attended to. The bed of the creek running from the brewery again became clogged up and gave rise to a disagreeable and unhealthy smell, which was removed as soon as the creek was cleared. It is, however, my duty to report to you, as I did before, that the refuse from the brewery should be destroyed or carried off in a separate pipe, and not allowed to discharge into and accumulate in the creek bed at the risk of causing disease in the municipality.

In addition, I would advise that the question of prohibiting the digging of holes in the ground for privy, water closet or cesspool purposes, as at present very generally practised, should be seriously considered and acted upon, as it is almost impossible to have

pure good water from a well in close proximity to such mentioned places, as they too often are especially in the centre of the village. There is often, we fear, a connection between the sickness with which we are afflicted and the close relation of water wells to the old fashioned and unsanitary human necessities and conveniences, which cannot definitely be traced and yet exists. The more scientific and sanitary methods in use in many cities would prevent this cause of disease. In conclusion, the history of another year confirms the fact that we have one of the healthiest municipalities in the Dominion.

W. H. JOHNSON,
Medical Health Officer.

HARRISTON.

Secretary's Report.

In the early part of summer the Sanitary Inspector made a thorough inspection and had every manner of nuisance promptly removed and abated. He gave active attention to these matters, and everything pertaining to a breach of sanitary requirements were abated without delay. According to a brief report of Dr. S. M. Henry (the only resident physician who gave any information to the Board) there have been a large number of cases of typhoid fever, he having had not less than thirty cases; a very large portion were of mild type and short duration; there were two deaths from this cause. Twenty-one has been the average death-rate for the three years preceding this, against eighteen for the present year; only a very small portion of these being attributable to infectious or contagious diseases. Dr. Henry attributes the cause of prevalence of typhoid, first, to the dry summer, causing great shrinkage of water in wells, which may have become contaminated from water closets in some cases, and second to decayed vegetable and animal matter, and recommends to the Board the adoption of the dry earth system of water closets for this town.

The Sanitary Inspector reports having carefully made inspection of hotel and other public places, and where any lack of cleanliness was found they were in all cases promptly abated.

The Board have made preparations for having the provisions of the statutes enforced, especially in the denser portions of population of the town, in regard to water closets, wells, cisterns etc., and inhabitants will be served with notices accordingly.

M. P. EMPEY,
Secretary.

HUNTSVILLE.

Secretary's Report.

I beg to submit the report of the Board of Health for 1887.

The health regulations have on the whole been very satisfactorily carried out. The Board, in the extremely hot weather of July, considered the wiser plan of dealing with any conditions likely to be detrimental to health would be to send their Inspector periodically through the village and have all such places thoroughly disinfected with chloride of lime. This has worked so well that—except two very mild cases, one of diphtheria and of typhoid, both completely isolated—Huntsville has been quite free from any infectious or contagious disease.

The Board's action last year in dealing with the slaughter house question has resulted in the removal of all slaughter houses beyond the corporation limits.

With a death rate far below the average, Huntsville is to be congratulated on her sanitary condition, and I have no doubt we shall have continued healthiness if we only give our prompt attention to the health laws.

R. W. GODOLPHIN,
Secretary.

LANARK.

Chairman's Report.

I beg leave to report that the Sanitary Inspector visited the premises of all householders and others in this village in the month of May, and where necessary gave directions for the cleansing of privy vaults, etc., and such directions were complied with generally without delay by those whose duty it was to cleanse the same.

There has not been any deaths during the present year from contagious diseases, nor has there been a case of either small-pox, diphtheria, scarlet fever, typhoid fever or measles during the year, a fact which speaks well for the sanitary condition of the village.

JOHN MACLEAN,
Chairman Board of Health.

LONDON WEST.

Chairman's Report.

I have the honor to lay before you my annual report for the year 1887. A great deal of labour has devolved on the members of the Board, especially those in the southern portion of the village.

Early in the spring a thorough system of house to house inspection was made and all premises ordered cleaned and put in a good sanitary condition. Later in the season advertisements were inserted in the papers calling public attention to the existence of any known nuisances and to notify the Board of such, but your chairman received no complaints.

Near the end of August an epidemic of diphtheria broke out in the southern part of the village, contiguous to the River Thames, and our Board took very active measures to prevent the spread of the disease, every case being isolated as far as possible and a thorough system of disinfection adopted. The same disinfectants and the system of house to house disinfecting was used as that recommended by the "New York State Board of Health." By this means the disease was kept from spreading, and finally eradicated entirely.

At the commencement of the epidemic this Board recommended that the school in the southern part of the village be closed, and the school trustees closed the school accordingly, and it was kept closed some two months, until all danger of spreading the disease by that source was past.

It is a significant fact that the disease first broke out right on the river bank where the sewage from the city of London is largely deposited and was doubtless the main cause of the disease, as all the cases excepting one occurred within a few hundred feet of the river. The total number of deaths reported from the disease is four.

I also find that a number of residents had to move away from their dwellings near the river entirely on account of the bad smell arising therefrom and the danger of contracting disease.

I cannot close this report without referring to the following extraordinary words found in the concluding part of the report of the City of London Medical Health Officer:—

"The insanitary condition of London West calls for the serious consideration of the citizens of London. That suburb is in a very unsatisfactory state and a source of danger to the city."

Just so! for the unsanitary condition of London West, if such condition exists, is due to the city itself. The very fact that the sewage of the whole city is deposited at our doors calls loudly for "serious consideration." When we take into consideration the enormous amount of sewage and refuse deposited in the river, not only from the 26,500 citizens, but the asylum sewage, the hospital sewage and its disease germs, the railway stations with their thousands of travellers, the large and small factories with their hundreds of workmen from the suburbs, all the hotels with their thousands of farmers and visitors, refuse from factories, etc., being emptied into the river where it is not allowed to flow freely away, but is held back by the city water-works dam, which, by its ebb and flow, causes a large portion of this sewage and human excreta to be deposited on the banks and shallows of the river, all along the banks near thickly populated parts of the village, throwing off sickening fumes and deadly disease germs, while in the spring we find the state of affairs much worse. During the winter much of this sewage and excreta is frozen in the ice, and when a thaw comes, or a freshet, this is prevented from passing away on account of the dam obstructing the stream; hence the river overflows the village, fills our wells and cellars with sewage and saturates the soil with filth and disease germs, and I am of opinion that so long as this state of affairs exist in our midst "no intelligent system of sanitation" would prevail against such a monstrous nuisance.

As you are aware, this Board has been trying to get this nuisance abated through the courts and that judgment has been given us against the city of London, but owing to negotiations that were entered into with the city the passing of sentence was suspended; and again, when the time came for it, owing to changes in the court and an application for appeal allowed, sentence has been delayed for a time, but that we shall ultimately succeed I have not the slightest reason to doubt.

In reference to our Medical Health Officers I need scarcely add a word, as you are aware there is no salary attached to the office; and as we have no resident physician in the village we have to go to the city for one, and it is not at all likely they will leave their own business to attend to ours for nothing but the love of the honour of being an official, with considerable abuse thrown in free.

JOHN CHAPMAN,
Chairman.

MADOC.

Secretary's Report.

There have been a few cases of malaria but no contagious or infectious diseases.

This state is attributable to the care that has been taken in cleanliness and draining.

The drainage of the mill pond and doing away of the mill dam, and other drainage along the west part of the village, and the thorough drainage on the east will, it is believed, remove anything that might be detrimental to the sanitary state of the village.

CHARLES GREAM,
Secretary.

MARKHAM.

Medical Health Officer's Report.

It is a matter for thankfulness and congratulation that during the past year the village has not been visited by any serious or widespread cause of mortality or sickness beyond the ordinary isolated cases which occur from year to year, and which, in my humble opinion, should be materially lessened. The sense of security has led to the inevitable and most direful result; that the health authorities, I regret to say, have become completely demoralized, so that all sanitary precautions have been neglected, so

that when that dreaded disease, diphtheria, made its appearance in one or two isolated cases in October it received but little attention, although all cases, or nearly all, that were reported to me were at once placarded, the only exception being where death had occurred before being reported, and disinfection made as thoroughly as the means at my disposal would permit. Yet in some cases (not reported) the children from infected houses were allowed to attend the public school, with the result that the disease is fast becoming alarming, and if active measures are not taken at once there is every danger of the disease becoming epidemic. There being reason to believe that there are several cases at present not reported, I have taken the responsibility of having the interested parties notified that the provisions of the Act would be at once enforced, and I trust to your co-operation to bear me out in this matter. Prompt and energetic action to prevent contagion will be required and I trust the result of stamping it out at once, as yet there being only three or four families affected. An important matter and one which should not be overlooked, and which I have for some years endeavored to mitigate, is the proper removal of excreta. As you are aware, the old style privy-pit is almost universal in the municipality, and nothing is a greater hindrance to sanitary perfection than this, particularly as in many instances they are dangerously near wells of drinking water and little or no attempt is made to keep them clean, or a larger and deeper pit is dug in the rear and contents raked into it, thus rendering the contamination of wells more certain; and I would urge upon you the necessity of securing such by-laws or enforcing existing ones in regard to distances and removal, or make dry earth closets compulsory. In the more densely populated portions of the village neglect in this matter is, to my mind, criminal. Another matter which has hitherto been general is the removal of garbage, which, in too many instances, is simply deposited in the kitchen yard and there allowed to decompose and pollute the atmosphere, and thus become a fruitful source of disease, and I would call your attention to the existing necessity for the adoption of some system for its proper removal.

W. ROBINSON,
Medical Health Officer.

MERRICKVILLE.

Medical Health Officer's Report.

At the close of the year 1887, as Medical Health Officer of this municipality and in accordance with instructions from the head office at Toronto, I have the honour to report that with the exception of an epidemic of measles during the months of April and May, this municipality has been free from contagious disease during the year. The remarkable contagiousness of this disease was singularly exemplified during the time the epidemic raged. Its origin was clearly traced to an imported case, and conveyed to others before its presence was known to your Board or recognized by the Health Officer. The simultaneous appearance of several cases led to the usual precaution being adopted, namely, isolation; but notwithstanding all efforts in that direction, it spread with such rapidity that the public school had to be closed for a season. The history of this epidemic of measles clearly establishes in my mind the fact that nothing but rigid and prompt quarantine of the first case recognized will prevent the spread of this disease where much inflammable (ripe to catch) material abound. Happily this epidemic ran its course without fatality, though in some cases leaving disagreeable consequences in young persons predisposed to lung trouble. This municipality has been remarkably free of other contagious and infectious diseases. While other sections of the country have been afflicted with typhoid and malarial fevers and diphtheria, we have been exempt except in a few cases of malarial fever. Of the latter we have within and around us abundant sources of trouble, and we must expect periodical visitations of these diseases of malarial origin as long as the bed of the river is filled with trunks of trees and stumps and other decaying vegetable matter left exposed every winter when the waters of the Rideau River

have been drawn off. It occurs to me that with a little trouble and trifling expense on the part of the corporation this evil might be reduced to a minimum, and in the end would well repay them. I would direct the attention of the Board of Health to the condition of the bay below the village and the foul stench emanating therefrom, as an illustration of this evil in its worst form. I have the honour to be your Medical Health Officer.

M. K. CHURCH, M.D., C.M.,
Medical Health Officer.

NIAGARA FALLS.

Medical Health Officer's Report.

My report of the sanitary condition of this municipality for the past year is very favourable. We have not been visited by any epidemic, and have been remarkably exempt from zymotic diseases. Notwithstanding the intensely hot summer there occurred very few cases of cholera morbus or of cholera infantum. Of diphtheria a few cases of a mild type occurred, and a few cases of typhoid fever also.

There has been but one case of scarlatina.

JAMES M'GARRY, M.D.,
Medical Health Officer.

PAISLEY.

Chairman's Report.

The Board met on the second day of June and took the necessary steps in order to put the village in a proper sanitary condition, and found the inhabitants ready to co-operate with them. Several cases of diphtheria were reported by the village doctors during the summer, which were of mild character, except three, one of which proved fatal. The Board took the precautionary steps to prevent the disease from spreading, in having these places isolated, which had the desired effect.

R. PORTEOUS,
Chairman.

POINT EDWARD.

Secretary's Report.

The sanitary condition of the village has been remarkably good during the year. There were a few cases of diphtheria in the early part of the season, and recently three cases of scarlet fever occurred. The health of the people is good with these exceptions. No medical health officer has been appointed and no meetings of the Board this year. I would advise, however, that the law relating to the public health be more stringently enforced than it has been.

W. MITCHELL,
Secretary.

[From this report it does not appear that the Board has taken any steps to prevent the further spread of the scarlet fever which has "recently" broken out. If this be so it is a scandalous neglect of duty on its part. Evasion of the law is not a praiseworthy action, more especially when the lives of human beings may be lost by not enforcing it.—
ED. REPORTS.]

PORT ELGIN.

Medical Health Officer's Report.

I have the honour to submit the following annual report upon the sanitary conditions of Port Elgin for 1887 :

The general health of the village throughout the year has been exceptionally good. No epidemics have prevailed. A few months ago a few isolated cases of diphtheria occurred but were of a mild character and showed no tendency to spread in the families affected.

I am happy to be able to state the live interest always shown by the Local Health Board in matters of sanitary interest, and it is gratifying to remark the readiness of the citizens in general to comply with the Inspector's orders, and the pride that they at all times evince in maintaining that neatness and cleanliness observed by all strangers and so attractive to summer tourists.

The practice of throwing kitchen refuse and slop water upon the yards and in the alleys should be condemned, and I should be pleased to see some system adopted for the removal of garbage in the warm months in the more thickly settled places where wells are in close proximity. During the spring when yards are being cleaned, the filth dumping-ground should be often inspected, and a plentiful supply of quick lime used for deodorizing and disinfecting purposes.

A few weeks ago I undertook to make a careful examination of our well water. Several reliable tests were adopted, more especially with a view of detecting organic impurities, and I am happy to be able to communicate a very satisfactory result. None of the water examined was found unfit for drinking or culinary purposes, and there was a marked absence of organic impurities, though one sample shewed a small percentage of inorganic impurity due probably to a decaying curb, and suggestive of the advisability of discarding the time honoured, but nevertheless faulty, common well system.

In this connection I think all householders should adopt, when convenient, the drive well system, because all evidence points to the purity of these subterranean water supplies.

With the recent improvements in this class of wells, many towns, especially in the western prairies, have been supplied with considerable amounts of water. A number of pipes are driven down a few feet apart until a water-bearing stratum of good capacity is reached. These are all connected with a system of iron mains of graduated capacity leading to a pump. Through exhaustion the pipes are made to draw from a wide area, the amount pumped limited only by the capacity and the extent of the water-bearing strata. Such a system of one hundred pipes some fifteen feet apart, connected with a common pumping station, have proved equal in Brooklyn to supplying 5,000,000 gallons daily.

In conclusion I have pleasure in testifying to the courtesy and painstaking always shewn by Mr. Currie in the discharge of his duties as Sanitary Inspector.

J. A. McARTHUR, M.D.,
Medical Health Officer.

PORT PERRY.

Secretary's Report.

The health of this township (Scugog) has been so good that the Board of Health has not had anything to do this year. There has been but one case of diphtheria reported during the year. The patient recovered. There has not been any other case of an infectious or contagious disease that I am aware of.

The Medical Health Officer has not made any report, and the Board has not taken any active measures this year, consequently my report is short.

JOHN FOY,
Secretary.

PRESTON.

Secretary's Report.

Notices to the people to put their respective places in sanitary order were issued in the spring, and subsequently, on the Inspector's visits, it was ascertained that these notices were complied with in almost all cases.

There have been a few cases of diphtheria and four deaths, also a few cases of typhoid fever of a mild nature.

Disinfection, isolation, etc., carried out; otherwise the village has been in a very healthy condition.

WILLIAM A. HUSBAND,
Secretary.

STREETSVILLE.

Secretary's Report.

Slaughter houses and the pig pens connected with them have constituted the greatest nuisance the Board has had to deal with during the year, and more or less dissatisfaction has been expressed that the nuisance has not been effectually abated.

One person was prosecuted and fined, under the Public Health Act of 1884, for establishing within the municipality the offensive business of slaughtering of animals without the consent of the municipal council. But the slaughtering of animals is still (there is good reason to believe) carried on in the municipality under conditions that violate the enactments of the Public Health Act. The Sanitary Inspector, as he reports, has experienced considerable difficulty in obtaining sufficient evidence to enable him to undertake a prosecution in respect of the nuisance complained of.

In order that the law may be respected it is necessary that its administration should reach all persons alike.

There has not been a single case of infectious or contagious disease during the year, and were it not for the slaughter houses, their piggeries and the feeding of hogs with animal offal, the village would be in an excellent sanitary condition. It is to be hoped that in a little time people's own sense of right and the enforcing of health laws will remedy this state of affairs.

W. J. PINNEY,
Secretary.

WALLACEBURG.

Medical Health Officer's Report.

I have the honour to submit the following report on the sanitary conditions of the municipality during the year just closed:—

The work of the Sanitary Inspectors has been done with greater promptness and efficiency than last year, and already there is manifested by the citizens a general respect for the Public Health Acts and the officers entrusted with their administration. In April the Sanitary Inspectors visited the premises of every householder in the village and

left a copy of a circular containing the more important clauses of the Health Acts relating to the duties of householders. In the latter part of May they made another general survey of the village, and found the instructions contained in the circulars had been generally observed. It was only necessary to have recourse to legal proceedings in one case, and in that instance the owner complied with the law as soon as information was laid. There was some difficulty experienced regarding the keeping of pigs in the municipality, but by constant vigilance on the part of the sanitary officers, there was scarcely a pig to be found in the municipality during the summer months.

The village has been singularly free from zymotic diseases during the year. There was not a single case reported until the month of August, and I am pleased to be able to state that, so far as I know, the medical practitioners here observed the law in this respect. During the year there have been reported to me 25 cases of typhoid fever, with only one death; 8 cases of diphtheria, with three deaths; 2 cases of scarlet fever, with no deaths. Isolation and fumigation were strictly enjoined in the cases of scarlet fever and diphtheria, with the result that, after notice of the disease was once given, in no case could it be said the disease had spread from the infected house.

What I said in my last annual report regarding water works can be repeated with double force now. Owing to the long continued drouth many of the wells in the village have been dry for months, and others have been continuously low and unfit for use during the same period. I am quite convinced that much of the diarrhoea amongst children in the latter part of summer was due to bad water. In order to prevent a recurrence of this state of things, our citizens must face the question of water works, and, fortunately, we are so favorably situated that this need not be a very formidable undertaking. And furthermore, I am assured from what I know of water works in towns no larger than ours, that if once established they could be made self-sustaining, without burdening our citizens with water rates beyond their ability or willingness to pay.

S. STEWART, M.D.,
Medical Health Officer.

WATERDOWN.

Medical Health Officer's Report.

Being your Medical Health Officer it is my duty at this time of the year to hand you in a report regarding the public health of this community.

In the first place we have every reason to feel thankful that we are so favourably situated. Nature has provided us with deep ravines that run through our village at intervals. These ravines serve a double purpose. They bring to our inhabitants a goodly supply of water and also act as sewers to carry off the waste and refuse of the place.

In the second place the situation of the village is high and therefore has no stagnant waters. Both of these are great advantages to a village.

We have not been visited by any widespread sickness or mortality during the past year. I have marked the increased interest taken by the local health officers of this municipality from year to year to prevent the spread of disease, and your efforts have been eminently successful. The proclamation alone that you caused to be posted up throughout the village compelling the inhabitants to have their privy-vaults cleaned out and disinfected by a given time has done much good. It has opened the eyes of the people to the necessity of attending to this matter. The work you have done in attending to the drainage of the village has had its good effect.

Of diphtheria I have seen some two or three cases, all of which were mild, but no scarlatina or measles. Of enteric fever I have had but two cases in this municipality, and one of these moved in here after having contracted it in another municipality. We have had very few complaints of nuisances. The sanitary condition of our village is good.

J. A. MCGREGOR, M.D.,
Medical Health Officer.

WATFORD.

Secretary's Report.

In the beginning of this year our Local Board was duly formed and a Medical Health Officer and Sanitary Inspector appointed and held their first meeting early in May, with the full determination to carry out the law with respect to the Health Act. At said meeting the Sanitary Inspector reported on the work already done and what he considered necessary to be done from the many complaints made to him on the want of a proper system of drainage, without which it will be impossible to carry out the requirements of the Health Act in this municipality. I was requested to bring this matter before the council, which I did, but no action was taken by council to comply with the suggestions made to them by our Board. Without the co-operation of the municipal council little good can be done in sanitary matters. The Medical Health Officer does not think it necessary to make a report for this year. He is satisfied with the sanitary state of our village, and thinks on the whole the general health of the municipality is very good.

In the early part of the season two deaths took place from diphtheria in one family, but the disease did not spread in the neighbourhood owing to a thorough disinfecting of the premises. At present we have no contagious diseases existing, and we have every reason to be thankful for the general good health of our village.

JOHN REID,
Secretary.

WESTON.

Medical Health Officer's Report.

Diphtheria broke out in the family of an English immigrant, four of the children being attacked. I attended the various cases and had the house isolated and free use of disinfectants employed. I am sorry to say that three of them died. After hunting around for the cause of the disease I came across an old cistern, the woodwork of which was rotten. I have no doubt but this was the primary cause of the trouble. The disease did not, to my knowledge, spread, although I have heard rumours of there being other cases in the town. I am not certain, however, as I did not receive any official report of such being the case. The cistern above alluded to was closed up.

THOMAS M. SAVAGE, M.D.,
Medical Health Officer.

TOWNSHIPS.

ADELAIDE.

Medical Health Officer's Report.

In presenting our annual report, we beg leave to state that during the year the deaths are fewer than has been registered for many years. We have had no infectious diseases with the exception of some cases of measles last winter of a mild type; no deaths from them that I am aware of. We have been exempt from fever and diphtheria. The sanitary condition of the township is good, although we have had to have nuisances removed in two instances. The inhabitants are waking up to the fact that cleanliness saves doctors' bills, promotes health and is the best means for preventing or removing disease from our midst.

L. F. CULLIN,
Medical Health Officer.

ALBEMARLE.

Chairman's Report.

I have the honour to present herewith the "Fourth Annual Report" of the Local Board of Health for the township of Albemarle, and in doing so feel it a matter for congratulation that during the earlier portion of the year we enjoyed perfect immunity from all contagious and infectious diseases.

We greatly regret to have to report that during the month of October and the earlier portion of November diphtheria made its appearance in the township, causing one death; but the disease was confined to but one family, and is now, we believe, entirely eradicated from our township.

As the medical health officer for this township was in attendance upon the patients, and as their friends were taking due precaution to prevent the spread of the disease, our Board did not deem it necessary for them to take any active measures in the case.

We are pleased also to have to report that the sanitary condition of the township has seldom been more satisfactory than it is at present.

ANDREW WEIR,
Chairman.

ALDBORO'.

Medical Health Officer's Report.

I am pleased to report that the township has for the past year been very healthy.

With the exception of a few cases of diphtheria, I have very little to report. They were not general but showing themselves here and there among the people, several of which came under my direct observation.

There was no cases reported to me by any of the physicians, but as near as I can judge six or seven deaths have taken place from that disease.

The system of drainage which is being carried out is doing much toward removing malaria from our midst; few malarial cases have shown themselves this season among the people, while formerly they were very prevalent.

JAMES S. MUNGER, M.D.,
Medical Health Officer.

 ANCASTER.
Chairman's Report.

It is gratifying to the Board to report that there is a marked improvement in the sanitary condition of this municipality within the past fifteen months, which opinion is confirmed by the reports of the Medical Health Officer and the Sanitary Inspector, who report that by comparing the number of contagious diseases and the number of deaths from them, will show that the sanitary condition of the municipality is better than it has been for the last few years. There has been one case of scarlatina, two of measles, nine of diphtheria and two of typhoid fever. Isolation and disinfectants were employed to prevent spreading.

T. A. WALKER,
Chairman.

ANDERDON.

Medical Health Officer's Report.

There was very little to do in regard to contagious and infectious diseases, but we are now threatened by diphtheria on the north and south of the township. I would suggest strict notification, isolation and disinfection and to be on the alert for next summer, as the cholera has been brought to the American shore, and would ask the Board to have all outhouses and wells thoroughly cleansed.

T. JAMES PARK, M.D.,
Medical Health Officer.

ARRAN.

Chairman's Report.

In presenting our annual report we have great pleasure in stating that this municipality has, during the year, been free from any epidemic disease and that the general health is good, the mortality being below average. Our Sanitary Inspector has, from time to time, visited the various school houses, inspecting their sanitary condition, and while there is room for great improvement, the sanitary condition has been greatly improved.

JOHN HEVERT,
Chairman.

ATHOL.

Secretary's Report.

I have much pleasure in reporting that the health of the municipality is good ; no cases of infectious or contagious disease ; no medical health officer.

W. MOORE,
Secretary of Board.

 AUGUSTA.

Medical Health Officer's Report.

I beg leave to inform you that Augusta has been very healthy for the last year. There has been no epidemic of any kind except a mild form of measles confined to the eastern side of the township in the neighbourhood of Roebuck, but as far as I can ascertain with no deaths. There has been a few sporadic cases of typhoid fever, but I think none except what has been imported into the township. There has been also some sporadic cases of diphtheria, but the disease has generally been of a mild type, more of the nature of diphtheritic sore throat than real diphtheria. I would strongly recommend the enforcement of more cleanliness about school houses and to see that the offices connected with them are kept in a proper state. I congratulate you on the comparative healthiness of the township.

A. T. DUNN, M.D.,
Medical Health Officer.

BARTON.

Chairman's Report.

There have been made very careful inspections of all slaughter houses, piggeries, fertilizing works, tallow rendering and oil works in the township, also a number of yards, cellars, privies and dwellings, and in most cases the slaughter houses and surroundings are kept in fair condition. Some were not found satisfactory, and in such cases the proprietors were at once notified to abate the nuisance, which they generally complied with. The piggeries are in many cases far worse than the slaughter houses on account of the material fed to the pigs; the swill brought from the city during the warm weather often smells very bad, and when fed in larger quantities than is eaten up right away soon causes a nuisance. The fertilizing works of Messrs. Rowlin & Co. have caused considerable trouble in looking after, and petitions have been presented praying for the abatement of the nuisance. The whole Board went and made a close examination of the premises and found that the proprietors had recently put in steam tight iron tanks, such as had been recommended some time ago by the Sanitary Inspector, but still there was some bad smell around the place. The Board suggested some changes in regard to the handling and drying, which, if complied with, we think the business could be carried on without causing any very great annoyance, as the exhaust pipes from the boiling tanks now are taken to the inlet. The tallow rendering establishment of A. McKillop has been frequently inspected, and there was found a large quantity of refuse that was smelling very bad. A notice had to be given them. There has not been so much trouble this year with the night soil, the heavy fines imposed last year taught some parties a lesson. The permission given to the Messrs. Strouds to receive it on their farm has been the means of a large quantity being taken there, and has been closely watched by the Sanitary Inspector. We are pleased to report that very few cases of typhoid, scarlet fever or diphtheria have been heard of during the year, and that the general health and sanitary condition of the township is pretty good. The expenses of the Board this year is fifty dollars, not including the inspection of night soil on Messrs. Strouds' farm.

JOHN W. GAGE,
Chairman.

BEDFORD.

Medical Health Officer's Report.

As Medical Health Officer for your township I have the honour to make the following report:—At the time of my appointment there were some cases of smallpox in the

adjoining township of Hinchinbrooke, quite near the Bedford line. I then made a tour of the township and vaccinated all who presented themselves at the various stations appointed. The number was not so large as would be expected, but this fact, I believe, was partially due to many having been previously vaccinated by physicians from the adjoining townships when the smallpox scare first arose. In that portion of Bedford more remote from Hinchinbrooke I found great carelessness on the part of parents with regard to vaccination. However, owing to proper precautions being taken by both townships in the matter of isolation, etc., the disease was confined to the one family.

You have been remarkably exempt from any widespread outbreak of disease of an epidemic nature. It is true some cases of scarlatina have come under my notice, but they were isolated, and consequently the disease did not spread. So far as I can learn no other diseases of an infectious character have visited you during the year.

There is one matter which I would like to call your attention to—that is, the ventilation of school houses, which I believe in this township could be greatly improved. Poorly ventilated school rooms is a fertile source of disease, not only tending to injure the health of the children now, but laying the foundation in them for future trouble. I would urge you to take some steps that would lead to a better system of ventilation in all our rural schools, and, believe me, you shall have my co-operation and assistance in any plan you may adopt.

ANDREW W. DWYRE, M.D.,
Medical Health Officer.

BELMONT.

Secretary's Report.

The health of the municipality has been good. There were a few cases of a mild form of measles, of which none were fatal; a few cases of scarlatina, none fatal, and a few cases of a mild form of diphtheria, two cases fatal. There has been no meeting of the Board of Health, as there was no complaints made. The council did not think it necessary to appoint a Medical Health Officer; there is, therefore, no report to make under that head.

PORTER PRESTON,
Secretary.

BENTINCK.

Secretary's Report.

In presenting to you the report of the Local Board of Health for the township of Bentinck for the year 1887, I have to state that the health record for the township for the past year has been remarkably good; the rules for cleanliness have been well observed, and there has only been one mild case of typhoid brought from Michigan, and which was immediately attended to with good results. The duties of the Board for the past year, with the exception of having nuisances in the shape of dead horses removed, have been very light.

DUNCAN CAMPBELL,
Secretary.

BERTIE.

Medical Health Officer's Report.

I regret to state that diphtheria has appeared in this municipality in two distinct localities, without, so far as I can learn, any communication with each other, or with other cases.

The first, a child of Aquilla Beems, at Stevensville, died of diphtheritic croup—from whence it was carried to two or three other families, but without any fatal cases. In the case of the dead child, Dr. Collver urged a private burial, but his wishes were not complied with, and as the facts were not reported to the Board, no steps were taken to prevent a public funeral.

The other case was a child of Solomon Baker, in my own practice, and is now convalescent, but it is too soon to tell whether others have acquired the disease. I immediately placarded the house and forbade communication with other children, and hope there will be no more cases. These cases occurred in November, up to which time for the preceding balance of the year we have had no contagious or infectious diseases; and I intended to congratulate you in my report on such freedom for the whole term. As it is we have reason to be thankful that our people have been so free from disease and that our township is in so good a sanitary condition, only a very few cases of nuisances having had to be dealt with.

N. BREWSTER, M.D.,
Medical Health Officer.

BEVERLEY.

Secretary's Report.

The work done by the Board for the year 1887 other than to meet and organize has been but small. No complaints requiring the action of the Board have been received, and the general health of the township will compare favourably with any former year. Dr. Forster reports two cases of diphtheria in his practice, and Dr. Smith two cases. No cases of typhoid have been reported. Since my last report I have registered one death caused by diphtheria, and one caused by scarlet fever.

W. McDONALD,
Secretary.

BEXLEY.

Secretary's Report.

This township during the past year has had several visitations of diphtheria and typhoid, but owing to prompt action by the Board and efficient treatment by local medical men, neither disease was allowed to spread. In each case the cause was traced directly to impure water or generally bad sanitary surroundings, but we are happy to find that people are beginning to see the direct advantage of complying with the requirements of the Public Health Act, with the result that there is a marked improvement as compared with a few years past. Our Board is properly organized, and is using its best efforts for the public good.

GEO. B. LEROY,
Secretary.

BIDDULPH.

Chairman's Report.

In accordance with the Health Act of 1884, I have the honour to submit my annual report. Strict care has been observed to prevent the accumulation of anything detrimental to the public health, and in only few cases had parties to be notified to abate the nuisance. A difficulty exists in a thorough enforcement of the Act through the

reticence of health officers giving offence, but when the knowledge of the origin of diseases and the means of their dissemination become better understood by the general public the duty of health officers will be greatly lightened. If knowledge of these things could be spread among the people, I have no doubt but it would be conducive of good. I have the honour to report the general health of the township in an excellent condition.

JOHN H. HODGINS,
Chairman Board of Health.

BLANCHARD.

Medical Health Officer's Report.

In compliance with the provisions of the Act respecting the Public Health, I beg leave to present the annual report for the year ending December 31st, 1887. This Board has, after a period of strict inactivity, been again revived. Let us hope that in the future the efforts put forth and the work accomplished by this Board may be of such value as to open the eyes of parsimonious and short-sighted economists to the benefits to be derived from sanitary measures.

The health of the municipality for the year has been very good.

In the month of April diphtheria made its appearance in two houses in one ward. Mr. Sanderson and myself visited the infected houses and had such precautions taken as to keep the disease from spreading.

In one of these families two deaths occurred out of six cases. Here the house and surroundings were in the worst possible sanitary condition. In this case we were unable to trace the source of the disease outside these unsanitary conditions. We ordered the removal of a new house which was built against the wall of the house and close to the door and well. We also ordered thorough cleansing and disinfection of the house and all clothing, and keeping of all members of the family from school or any public gathering for at least six weeks after all signs of the disease had disappeared.

We found in the next house that the lady suffering from the disease had contracted it while visiting in St. Mary's. Every precaution here was taken to prevent the spreading of disease. On the first intimation of diphtheria the school teacher, who boarded with the family, sought another boarding house. We advised that she should not return for six weeks after the disease had disappeared.

We visited the school in this section. The grounds we found undrained and saturated with water—a veritable swamp with no good means of drainage.

The well was filled to the top with water. It seems to be a good receptacle for surface water. It is impossible or next to impossible to have suitable drinking water here. The water closets were in a filthy and disgusting condition—so situated that the well must be contaminated by soakage from them. We urged that means should be taken by the trustees to have the grounds drained, the well pumped out and cleaned, and the privy pits filled up and boxes placed in the privies, and that the daily collections in these boxes be covered with dry ashes or earth to disinfect the discharges, and we added that the boxes should be frequently emptied. All the schools in the township were visited by members of the Board. Some sections were reported in a good sanitary state while many were found in an indifferent condition. Similar instructions were issued to all the sections as were given to the one above mentioned.

Diphtheria has made its appearance on the tenth concession of this township during this month; we have taken precautions to prevent its spread in this case.

Typhoid fever made its appearance in two families during the fall. The families occupy neighboring houses. This disease owes its origin to germs taken into the system principally through drinking contaminated water. Four cases have occurred in each family, and of these three have died. An examination of these dwellings and the surroundings point to the water supply as the cause of so much trouble.

It would be well for the Board to notify the public through the press or by posters the law regarding the annual cleaning of wells, and the precautions to be taken to prevent the spread of infectious diseases. By this means a great deal could be done to protect the health of the public and prevent the spread of those diseases which, when allowed to spread, prove so fatal.

The ventilation of public buildings and the heating of such buildings, as well as the water supply, are subjects worthy the consideration of this Board. The heating and ventilation of our schools, for instance, are only next in importance to a pure water supply.

Hoping that our efforts in promoting the health of the municipality may be greater in the future than in the past.

W. IRVING, M.D.,
Medical Health Officer.

BLLENHEIM.

Chairman's Report.

Early in the spring the Board formed into committees to visit the school houses and slaughter houses in various parts of the township. These were found generally in a cleanly state, and any defects were promptly remedied. We have no regular Medical Health Officer appointed. The sanitary condition of our township is such that we have little to complain of. Cellars and out houses are kept clean, and our township is free (and has been for some time) from epidemics.

W. R. PENTLAND, M.D.,
Chairman.

BRANTFORD.

Medical Health Officer's Report.

It is difficult to give a correct report of the condition of this township from a sanitary point of view, as compared with last year, also the prevalence of disease and its causes. We have no appropriation of funds from Government to Local Board of Health to assist us in getting accurate and most valuable information in respect to those important matters. I am sure that a well paid, vigilant health service would contribute more to the happiness and pecuniary economy and general well-being of the people than any other branch of civil government. The inauguration in every township of a system of sanitary inspection of school houses and their surroundings, and the scientific investigation of the nature and cause of all epidemic diseases, wherever they may be found, is, I think, what should commend itself to the common sense of everyone. There have been no epidemics of any kind in the township of Brantford this year. Typhoid fever has been less prevalent south of the Grand River than usual, and, as far as I can learn, a fewer number of cases have occurred north of the river than last year. Sporadic typhoid fever is essentially a filth disease; there is no doubt in the minds of scientific medical men that this disease, which destroys so many valuable lives every year, can be stamped out altogether if the knowledge we possess is thoroughly carried into effect. The old-fashioned privy pit, which defiles the air we breathe, the water we drink, and the food we eat, is, in my experience, often responsible for the death of many an innocent victim. We have succeeded in this township in inducing some of the boards of trustees to build improved water closets, with water-tight pits, and once daily covering the excreta with dry earth. I would strongly recommend that our efficient inspector visit every school in the township once or twice yearly, and be clothed with sufficient authority to compel the trustees to carry out the most modern reform in sanitary measures. The large majority of cases of diphtheria which have come under my observation for the past two years, I have been able to trace to contagion from schoolrooms; it has been less prevalent this

year than last. It is a disease that, by the enforcement of proper remedies, can be reduced to a small percentage of mortality. I would also advise to have posted up in every school house printed instructions showing some of the most important laws regulating the health of individuals, and also have hygiene and sanitary science taught in all our common schools. When human life is rated at its true value, then, and not till then, will the government wake up to the necessity of employing able and efficient officers, at any price, to enforce laws that will preserve it.

Malaria has been the chief cause of sickness in the township this year, owing to the exceptionally dry season which we have had. There has been an insufficient quantity of water to drink, consequently impure surface water has been used, and many old bog holes, which were formerly covered by water, were dried up, and the poisonous surface exposed to the rays of the scorching sun, generating disease over a whole countryside. The day, I trust, is not far distant when all standing water, whether in mill-ponds or in swamps, will be drained by the arm of the law, if not by the reason and common sense of the people.

I trust, gentlemen, that next year I will be able to give you a more accurate report of the diseases and their causes occurring in this township. I intend to communicate with all my medical friends located here and ask their co-operation in preparing a correct account of the number of deaths from contagious diseases and causes of death, as far as known.

Thanking you, gentlemen, for the kind hearing which you have given me in reading this very imperfect report.

D. MARQUIS, M.D.,
Medical Health Officer.

BROCK.

Medical Health Officer's Report.

In making this report we have experienced considerable difficulty in endeavoring to give an accurate account of the sanitary condition of the municipality, owing to the neglect of other medical men practicing in the municipality to report cases of contagious diseases and other items of public interest occurring in their practices.

In the spring the inspector made his usual house-to-house inspection, but this, we fear, is rapidly degenerating into a mere matter of form, some not knowing that their premises had ever been visited by the inspector. Not only should the back yards and closets be examined, but the cellars, stables, outhouses, wells, etc., should be thoroughly examined so that no decomposing animal or vegetable matter, or filth of any kind, could possibly escape detection. The authority of the Board has only once been questioned, and that was by the owner of a horse which died and was buried in the centre of the village. The inspector notified the owner and his assistants to have it removed at once, but they refused to comply with the notices; they were then subpœnaed to attend a magistrate's court and show cause why they refused to remove the carcass. The result was that they were each fined five dollars and costs, and given twenty-four hours in which to have it removed. The result was quite satisfactory, the carcass being removed forthwith. The Board is to be heartily commended for their determined action in this case.

With regard to contagious diseases, diphtheria has been unusually prevalent, there having been sixty cases reported, seven proving fatal. This fact should earnestly engage the attention of the Board and lead them to consider carefully whether they are doing everything that lies in their power to arrest the progress of this loathsome disease. The means adopted by the Board of arresting and preventing the disease are, indeed, very meagre, and consist simply in placarding the infected house, then leaving it to its fate. This, no doubt, has the effect of preventing neighbors going in, which is very desirable, but at the same time it cuts off all supplies, thus making it absolutely necessary for the inmates of the placarded house to go out and procure food and other necessities whence they can, thus scattering the germs of the disease all around. When the Board placards

a house it is but justice to the owner and the public generally that they exercise a careful supervision over that house, examine the whole premises most thoroughly, and remove every trace of filth and dirt, see that no person is allowed to go in or out of the house, and also to see that they are properly supplied with food, medical attendance, nursing, etc. This is clearly the duty of the Board, and the municipality expects it from them.

There have been twenty-eight cases of typhoid and twenty of scarlatina reported. Fortunately, however, none of these proved fatal. Before leaving this part of our report, we feel compelled, though very reluctantly indeed, to refer again to the condition of the wells and privies. Year after year we have condemned these abominable privy pits and shown how that the water in our wells must necessarily become more or less poisoned, but all to no avail. Of course these are supposed to be inspected every spring, but unless the privies are actually running over, or the water stinking, they are passed over as being in good condition and in no way injurious to the public health. This is by no means a pleasant subject for us to refer to, and we would gladly let it pass, but we feel it our duty to urge the council to abolish these privies and establish a system of dry earth closets, the expense of which, to a wealthy municipality like ours, would be trifling, but the gain would be incalculable.

We would advise the Board to insist on all the medical men practicing in the municipality sending regular reports of contagious diseases, deaths, etc., so that we may be in a position to furnish the Board with accurate statistics for the whole township. At present we have only our own practice to refer to.

We are quite sure that the Board is willing and anxious that nothing should be left undone that would tend to the interests of the public, but that they allow themselves to be hampered by the cry of economy raised by a few narrow-minded ratepayers who are loud in their condemnation of everything that does not add to the public funds and also threaten to use their franchise against those who do not coincide with their views, but the time has come when our representatives should rise away above and beyond such petty opposition and consider first and only the welfare of the public.

Hitherto the Board has been practically a dead letter, while there has been an abundance of work to be done.

In conclusion we would again urge the Board to an active sense of their duty and responsibility, and trust that they will demonstrate to the public that they are alive to their interests by displaying an intelligent and practical knowledge of all sanitary matters, and a determination to strictly enforce the law, in which they will receive the hearty support of all right-minded citizens.

All of which is respectfully submitted.

DRS. M'DERMOTT & FIERHELLER,
Medical Health Officers.

BROOKE.

Medical Health Officer's Report.

In accordance with notice received from your secretary, W. G. Willoughby, Esq., to make our report as Board of Health and submit it to your honourable body, and as I have been appointed your Medical Health Officer for the current year, I beg to report as follows: In the first place, we have reason to be grateful that there were not many cases of contagious fevers, as typhoid, only one case came under our observation, and as for diphtheria, it is completely stamped out. This year has been unusually healthy as far as epidemic diseases are concerned. We congratulate ourselves upon the removal from our midst of so much malarial fever, from the fact that the stagnant water on the M. C. R. has been made to find an outlet to the river from our station. On the whole this community is one of the healthiest places in Canada.

ALLAN CRAWFORD, M.A., M.D.,
Medical Health Officer.

BRUCE.

Medical Health Officer's Report.

In presenting my annual report I congratulate the people of the township on their immunity from any epidemic of either contagious or infectious disease during the year.

During last winter there were some cases of diphtheritic laryngitis, a few of which proved fatal. A mild form of diphtheria has appeared lately, but no fatal case is reported as yet.

Measles and whooping cough have been prevalent, but both of a mild and favourable type.

On the whole, the sanitary condition of the township has been exceptionally good during the year.

A. MACKAY, M.D.,
Medical Health Officer.

BRANT.

Secretary's Report.

The township for the last year has been kept in good sanitary condition, the inspector having visited all the school houses, slaughter houses, cheese factories, and creameries, and reported the same in good condition.

The Medical Health Officer reports two cases of diphtheria, but the parties recovered ; he visited the premises and had them properly disinfected.

JAS. S. LAURIE,
Secretary.

BURFORD.

Medical Health Officer's Report.

The only cases of infectious diseases, of which I am aware from official returns and personal observation, occurring since last annual report up to this date in this township, were : measles, two cases ; whooping-cough, one case, and typhoid fever, two cases, which recovered. Rumors have been current that diphtheria has been in this township this year, but I have had no return of such from the physician in attendance, and on presenting a blank return form to the householder to be filled in, he denied that it was then in his house.

A dog was observed devouring excrement from one whom I knew had a bad attack of typhoid fever at that time. The dog was kept under observation for weeks and has remained apparently quite healthy.

I should judge that the health of the drained portions of our township will be favourably affected by the extensive drainage operations lately carried to completion therein.

I have to recommend to your notice the Harbottle system of properly ventilating buildings.

I have omitted many mechanical details and have possibly been prolix.

ROBERT HARBOTTLE, M.B.,
Medical Health Officer.

Sanitary Inspector's Report.

All complaints regarding unsanitary condition have been attended to. The nuisances have been abated but with considerable trouble, in one instance at least. Hog pens and

slaughter houses are now in a better condition than for some years. Not long since Dr. Harbottle, medical health officer for the township, received a card from Dr. Durand, saying that he understood from some of his patients that there was a dead animal lying unburied, but he did not state in what locality it was. I did not feel justified in putting the township to the expense of a visit without having something more definite to work on.

ALBERT LESTER,
Sanitary Inspector.

CAISTOR.

Secretary's Report.

The Municipal Council of Caistor has not carried out the regulations more than to appoint members of a local board. We have no medical health officer appointed. I would say, however, that the health of the people of the township has been remarkably good, considering the bad state of the water supply, on account of the severe drouth we have passed through, the wells and cisterns being all about dried up, and the people had to use water that in other seasons would have been considered unfit for use, the water in the drilled wells being unfit for culinary purposes, only good for stock; we have not as yet seen any bad results from the water famine.

We have a few cases of whooping-cough, and that is about all the infectious disease that is among us.

H. J. SHARP,
Secretary.

CALEDON.

Medical Health Officer's Report.

In laying before you my third annual report, I must congratulate you on the lightness of your duties during the past year, so much so that this, our annual meeting, is our only meeting during the year. We have, however, been free from anything like an epidemic, although the returns show an increase of typhoid fever. Owing to the continual drouth the supply of water for drinking purposes has in some localities been insufficient; the only instance in which the disease assumed anything like the form of a local epidemic, was the outbreak in the village of Credit Forks; during the months of September and October five cases occurred there consecutively in houses adjacent to each other. These cases I found due to two distinct causes—bad hygienic conditions, and to impure drinking water. The houses in this village are closely huddled together, and the lots being very small, the privies are, in many instances, immediately behind the back door; there the slops are thrown just outside of the door and form regular hot-beds of filth. Strangely enough, there is not a well in the whole village, the only supply of drinking water being from two springs; one situated near the Credit River behind a row of houses, the other by the road side to which cows and pigs have access. I took samples of water from each of these springs and made a rough analysis of them; the one contained a large amount of salines, evidently caused by soakage from the privies; the other by the road side contained a large amount of organic matter evidently from access of surface water. The spring by the road side, if properly cleaned and drained and protected from cows and pigs, might give a fair supply of drinking water, but no one seems to take any special interest in it—so it remains in a neglected condition.

Being frequently called to Credit Forks professionally, I made almost a house to house visitation, advising the people to clean out or remove their privies, but very few ever took the trouble to follow my advice. In this connection I wish to make a suggestion, viz., that the Board procure printed cards requesting that all wells and privies be

cleaned in accordance with the "Health Act," these cards to be placed in Post Offices and other public places, every spring, and then returned to the health officer until they again require to be posted up during the following spring. When I ascertain that there is more than one case of infectious disease in any particular part of the township, I then visit that particular locality and make enquiry into the general surroundings, means of disinfection used and isolation of the patients. In passing through the Village of Cataract one evening, I was called in by a lady to see her daughter, aged seven, who, she said, was very ill; I found her suffering from the first symptom of scarlet fever, and from the intensity of the symptoms, judged that the attack would be very violent; in this our fears were realized, for at the end of the second week the little patient died from exhaustion. There had been no cases of scarlet fever in that neighbourhood for about a year, the mother had not taken the child any place where scarlet fever had been, nor had anyone from a distance been visiting her, and I was at a loss to account for the source of the contagion. However, just five days previous to the child taking ill, her mother had taken her up to Alton Village, three miles distant on the C. P. R., but as there had been no cases in Alton for nearly twelve months, I concluded that she must have come in contact with some infected person on the train. I accidentally learned that a child of conductor H—— of the C. P. R. had just died of scarlet fever in the town of Elora two days after the death of my little patient; I interviewed the conductor on the first opportunity, and found that scarlet fever had been in his family for about a month, all the other children having recovered. He then remembered that on the night my little patient and her mother had gone to Alton, he had nursed the little girl on his knee for about half an hour. This brought the source of infection to light, and the conductor being a conscientious man, felt shocked that he had unwittingly been the means of spreading a dangerous disease. Had his "official clothes" been disinfected and had he been isolated from his family as much as possible, this little girl would, no doubt, be alive and well. It is impossible to say how many other children passing through on his train may have been infected, and what trouble and suffering might have been saved had proper precautions been used. It simply shows the necessity for the disinfection of public conveyances, viz., steamboats, railways, stages, etc., and that the officials in charge of the same should be kept separate from any source of contagion.

My tabulated report is incomplete, but is more thorough than any previous one.

	Cases.	Deaths.
Typhoid Fever.....	27	4
Scarlet Fever.....	6	1
Diphtheria.....	17	2

Cases of measles are not reported, nor is mumps or chicken-pox, as in these cases it is not very often that the physician is called in.

In conclusion, let me say that although our duties during the past year have been light, it is always a satisfaction to know that we are in a position to act with promptness and decision should occasion or necessity require it, and that our principal duty is to be ready at all times to act in the interest of the public health.

JAS. ALGIE, M.B.,
Medical Health Officer.

CALEDONIA.

Secretary's Report.

I have the honour to report that the general sanitary condition of this township during the past year appears to have been good. We have no slaughter houses, tanneries, and only two cheese factories within the township, and they are isolated from dwelling houses.

There were no cases of contagious or infectious diseases up till the autumn, when a

serious outbreak of diphtheria occurred in a back settlement, caused, it is supposed, by the water not being good, the locality being low and swampy; and although the disease was confined to a few houses, it was of a most malignant type and there were a number of deaths.

But as neither the physicians nor the householders reported or brought the matter before the Board of Health, I myself determined to take the matter in hand, and on the 29th of November I notified the Board to meet. A meeting was held that day, and although there was no complaint to act upon, it was determined to stamp the disease out at all costs. The Medical Health Officer was notified to examine the families of the locality and report where they had the disease. He did so, and the three infected houses were quarantined and a guard placed over them, the schools in three school sections stopped for a time, and other measures taken to prevent the spread of the disease. I am happy to report that there have been no new cases for two weeks, and we think we have it effectually checked. The number of deaths was upwards of twenty.

I would respectfully suggest a more general distribution of the Health Laws and other pamphlets on the subject, printed in French as well as English, for the information of the people, a large proportion of whom still believe that those diseases are not contagious, but are sent by the Almighty, and that it is wrong to interfere with His will. They fiercely resent all attempts to enforce the Health Act.

JOHN DOWNING,
Secretary.

CAMBRIDGE.

Secretary's Report.

The Local Board of Health of this township met several times during the year, and generally, when any disease was discovered to exist, the general rules adopted then were the placarding of houses which had become infected and a guardian appointed by the Board for the purpose of seeing to the wants of such isolated families, and also for preventing the public to mingle with them. This had the effect of stamping out the disease at once. We have had, to my knowledge, about twenty cases of diphtheria among the children, which resulted in the death of five or six; there were also a good many cases of measles, typhoid and scarlatina, but without any fatal results. We have had no other kind of disease or epidemic during the year, and with the exception of a few cases of diphtheria at the time of making this report, this township is in a very good sanitary condition.

The report of the Medical Health Officer is not yet received.

O. LAFRANCE,
Secretary.

CARTWRIGHT.

Secretary's Report.

In the month of May, 1887, the local practising physician reported four cases of typhoid fever, in June one case, and in July two cases of the same disease, all of the seven cases being in one family, and only one of which proved fatal—a person 70 years old.

This Board took every precaution to have the village thoroughly cleansed, and the premises, where the disease was, cleansed and isolated as far as possible.

WM. LUCAS,
Secretary.

 CHARLOTTEVILLE.
Medical Health Officer's Report.

I take pleasure in submitting to you my annual report as Medical Health Officer for the Township of Charlotteville.

The first part of this year passed over with little or nothing worthy of mention, except the absence of an epidemic of any contagious disease.

We were visited with our usual amount of sickness and of its usual character, but the long continued heat and drouth of summer and early autumn brought down as its victims many of all classes and ages. During the month of August and the greater part of September, diarrhœa, dysentery and malarial fever raged rampant. Yet the mortality was less than the average, not only as the result of our sanitary organization, but also from the fact that the inhabitants of this municipality apply for medical aid at an earlier date of their sickness than they used to do, which is all important in the treatment of all such diseases, and hence the more favorable result.

Diphtheria appeared in October. Was carried home by a young lad who contracted the disease while visiting friends in the town of Simcoe, and, though appearing in three other families since, it has not, at the time of making this report, spread beyond the families first attacked; but on account of the proximity to school house of one of the families seized with diphtheria, it was deemed prudent to close the school until the disease had disappeared from that locality.

In conclusion, I wish to call your attention to the very slovenly, careless and unsanitary kept condition of the school rooms throughout this municipality.

W. J. McINNES, M.D.,
Medical Health Officer.

 CLARKE.
Chairman's Report.

I beg to submit the following report respecting the sanitary condition of the municipality for the current year 1887. The Board met twice only during the year, the last session thereof being held on the 28th day of November inst. It has not yet been deemed necessary to appoint either a Medical Health Officer or a Sanitary Inspector, but the Board divided the municipality into five divisions or beats, and placed them under the supervision of the members respectively. They were instructed to visit all places in their beats suspected to be kept in an unwholesome manner, and to notify the occupants to put their premises in a sanitary condition as the law directs.

The township during the present year has been almost entirely exempt from any infectious or contagious disease excepting three cases of typhoid fever of a mild form. No deaths.

The Board is prepared to put the whole machinery of the law in operation if necessary to prevent the spread of contagious and infectious disease should such appear in the township.

JOSEPH JACOBS,
Chairman.

 COLCHESTER NORTH.
Medical Health Officer's Report.

My report for Colchester North is brief. No epidemics have visited us. Diphtheria only in one family, with one death, and a few cases of typho-malarial fever—all making good recovery—is the sum total of our serious diseases during the year.

The township is level, and in it are still large blocks of bush ; but we account for the good health of the people by the very systematic drainage of the whole township, which has been done within the last few years.

E. PROUSE, M.D.,
Medical Health Officer.

CROSBY NORTH.

Secretary's Report.

In obedience to your circular of Nov. 18th, I send you the annual report of Board of Health for the Township of North Crosby for the year 1887 :—

There was no Medical Health Officer appointed for this township.

There has been very little work done by the Board this year ; we have had only two meetings.

The health of the people in this township has been all that could be desired until within a few weeks. There have been five cases of diphtheria recently, resulting in one death. The other cases are recovering, and we hope, with proper care, it will not spread beyond its present limits. There have been no cases of typhoid fever or other infectious disease in our township within the year.

JOHN McGUIRE,
Secretary.

CROWLAND.

Medical Health Officer's Report.

As Medical Health Officer, and in compliance with schedule "A." of the Public Health Act of 1884, I beg to submit my annual report respecting the sanitary condition of this district.

The general sanitary condition of this municipality will compare favourably with the more healthy of those throughout the Province, there being, with perhaps one or two exceptions, no locality from which we might reasonably expect poisonous effluvia which might develop or, at least, so contaminate the atmosphere as to favor the spread of contagious diseases. I know of no complaints having been made, and so far as my knowledge of residents of the municipality goes, I have reason to think they cheerfully wish to comply with the requirements of the Public Health Act.

I am not aware that we have had any contagious diseases with the exception of measles, scarlet fever and diphtheria, and these have not been very prevalent ; the cases of the two former having been of a mild type ; in the latter, however, some of the cases were very malignant.

At Cook's Mills we have had, for a number of years past, an occasional outbreak of diphtheria, the type of which has been more than usually severe. Whether the decomposition that has been going on in the refuse connected with the old saw mill and tannery has or has not been productive of disease germs, it is certain that the most malignant type of this disease that I have had to contend with in my professional capacity has been in this immediate neighbourhood.

JAS. SCHOOLY,
Medical Health Officer.

DARLINGTON.

Secretary's Report.

The Township Council of Darlington appointed a Board of Health and a Health Officer. But there has been nothing requiring their attention, and nothing has been done. The sanitary condition of the township is excellent.

R. WINDATT,
Secretary.

DERBY.

Medical Health Officer's Report.

The absence from our midst of epidemical, contagious and malarial diseases is a fact patent to your Board and worthy of congratulation by the inhabitants of the township. The untiring efforts in the work of sanitation of the Local Board of Health from its first organization can only be appreciated by the people at large for whose benefit sanitary laws have been called into existence. The Health Inspector has, in his good judgment, exercised his authority in matters pertaining to the public health to the entire satisfaction of the municipality. The Board may congratulate itself on the fact that through its existence and prompt performance of its functions, an immunity from disease has been secured to the people.

CHAS. E. BARNHART, M.D.,
Medical Health Officer.

DEREHAM.

Medical Health Officer's Report.

In making my annual report for the year 1887, I regret to state that I am unable to report with exactness the amount of sickness in this municipality during the year, as the medical men of this locality have not reported to me concerning any of the cases under their care. But so far as I have been able to ascertain I think we have abundant reason to congratulate ourselves on the absence of any serious epidemic of any kind, especially when we take into consideration the intense heat of the summer months and the extreme scarcity of pure water for household purposes. We have been comparatively free from contagious or infectious diseases, with the exception of a few cases of typhoid fever of a very mild type. I have heard of but one case of diphtheria in this division. We have also been free from scarlet fever in this neighbourhood, although I have attended a few cases in the municipality south of us; also, I saw a few cases in the north half of the township; also a few cases of mumps, but all were mild cases and made rapid and complete recovery. So far as I am able to learn the Health Inspector and members of the Board of Health have endeavoured to discharge their duty.

H. MINSHALL, M.D.,
Medical Health Officer.

DORCHESTER NORTH.

Secretary's Report.

The Local Board of Health of the township of North Dorchester, in the County of Middlesex, would respectively report for the year 1887 as follows:—

The Local Board has not experienced the least trouble in carrying out the provisions of the Public Health Act, as the residents of this township have at all times shown a cordial disposition to carry out whatever orders and suggestions the Board was called upon to make. The sanitary condition of the township and the health of the inhabitants are in a very good condition for this term.

Diphtheria has broken out two or three times, but owing to the manner in which the cases were watched and the houses quarantined the disease was strictly confined to one or two houses at each time. There were ten deaths. The disease had spread to the second family before the doctor in attendance was aware of the character of the disease, but by strict observance of the law it did not spread any further. The Board at present is in a good working condition and is using its best efforts in the cause of public health.

D. P. AYLSWORTH,
Secretary.

DRAPER.

Secretary's Report.

Owing to the excellent sanitary condition of these townships during the past year the Chairman did not consider it necessary to call the board together. There has not been a case of any contagious disease; the deaths have been few and confined to infants and elderly persons. The Board has always been prepared to act should occasion arise, but as above stated it was not required.

FRED. N. TOYE,
Secretary.

DUMFRIES NORTH.

Medical Health Officer's Report.

In compliance with the Statute of 1884, I beg to report that I have again visited the schools of the township to ascertain their sanitary condition, and to secure the co-operation of the trustees and teachers in effecting such changes as may conduce to an improved state of the premises and health of the pupils.

The topics which I conceive to be more immediately within my province, and which most directly affect the health of the pupils, are: School sites, heating and ventilation of the rooms, admission and direction of light, general cleanliness of the house and water closets, water supply, epidemics, unsuccessful vaccinations, etc.

With regard to the school sites I think it much to be regretted that so many have not chosen wisely. It is a matter of surprise that in a township where land is comparably cheap, and the aggregate wealth of each section so great, that small and unsuitable sites should in any instance have been selected. To such as contemplate change in the near future I would suggest that ample grounds for out-door play—say two, three or more acres, with easy drainage, be selected. The house should have a southern aspect, so that the open door may readily admit sunlight and warmth, and better that it occupy the back of the lot so that water closets can be more effectually separated and removed from the play-ground. Heating in most all the schools is defective, heated as most of them are by large box stoves situated either at the entrance or near the centre of the rooms, and when required to be operated in "full blast" makes pupils near it most insufferably hot, while others most distant suffer from cold. To remedy this various plans have been suggested. To me one of the most commendable is the "Jacket Stove," with tubes opening upon its heated surface within the jacket, coming from without, bringing in pure air. In addition to this I would suggest that each school room be supplied with open fire-place or grate-stove, at which, during cold weather, pupils could be more quickly and thoroughly warmed upon arrival at school. This open fire-place, or grate, having a flue extending from the floor to the top of the building, would supply a most efficient means of ventilation. Even in mild weather, with a modicum of fuel to warm the flue, it would more effectually remove the impure, oft-breathed air of the room than almost any other way. The only means of ventilation in the schools is by the doors, windows and apertures in the ceilings. In some instances these holes were nearly over the stoves, permitting the escape of much of the heat and doing nothing to relieve cold feet.

The window sashes in a few instances were suspended, and when ventilating the room from this quarter there was, with one exception, no provision to prevent direct draft upon the children. The appliances to the sashes to remedy this condition have been suggested to trustees and teachers. I regard the defective ventilation of the school rooms as one of the most vitally important matters that concerns the health of the schools. When we reflect that a thousand cubic feet of pure air is about the normal amount required by each individual, and that this amount requires changing three times per hour, you will be able to appreciate the force of my remarks, when I tell you that the average cubical capacity

of the schools in this township is a trifle less than 273 cubic feet per pupil, and by re-breathing becomes unfit for respiration long before recess, unless the teacher finds his own sensibilities blunted by the same agency, suspects the insidious cause and attempts to remedy the condition from window or door. I hope, through Dr. Cassidy, Member of Provincial Board of Health, Toronto, to be able to supply a very accurate and inexpensive means of determining the condition of the air in school rooms when unfit for respiration. This, with two or three thermometers in each school room, will enable the intelligent teacher to determine the rate at which all are being poisoned, and enable him to mitigate or prevent somewhat a condition of impure atmosphere which seems inseparable from school rooms.

In one instance only was the water supply found, upon analysis, unfit for use. The proximity of wells to water closets and the chances of surface contamination have been noted and the trustees advised in the matter. I have also enjoined upon them to have the wells containing large bodies of water pumped out after spring thawing and mid-summer vacation, and to carefully guard at all times against surface water contamination.

The objectionable condition of the water closets so noticeable last year has with one exception been corrected. That instance was again brought to my notice by the Inspector of Schools. I am now assured by one of the trustees that this most filthy and disgusting condition has been put in order. With this exception all trustees and teachers have cheerfully complied with my advice, and, I believe, have attended to the means advised to have all closets regularly disinfected, as well as to put and maintain in a sanitary condition the entire premises. I am pleased to be able to report that most of the rooms were found in a fair state of cleanliness. School Section No. 26 was exceptionally good, and but one had not been scrubbed or especially cleaned to the teacher's knowledge, though he had been there for three years. It has, however, undergone a cleaning process by which that antiquated musty smell has quite disappeared. Those school rooms that were clean, bright and devoid of that familiar odour are quite too few.

The sweeping is generally done by the children at noon, and hence insufficient dusting afterwards. I have advised scrubbing and cleaning all wood work twice a year and in some cases oftener. The seating in most of the schools consists of two, or at most three, grades of seats: as in almost all schools there is a very noticeable want of adaptation of pupil and seat, injurious consequences too frequently follow to both form and vision. Some are seated at desks so high that a most unnatural position was necessary to write, and the face at all times so close to work that injury to vision is likely to ensue. I indulge the hope that a seat will yet be devised that can in a moment be adjusted to suit each pupil, and the liability to distorted spines obviated. No reports of epidemics seriously interfering with the schools have existed. Recently No. 26 had an outbreak of diphtheria, and it was thought better to close to prevent spreading. The school has reopened. I am not aware that any pupils are now kept out from this cause.

The number of pupils who had not been successfully vaccinated was very small. I enjoined upon the parents through the children to comply immediately with the requirements of the law in that regard.

Mr. Chairman, in concluding this general report of work done in the schools, I wish to say that from the nature of my work and its relation to the trustees of the schools in their capacity as custodians of the school property, I have thought it would be carrying out the object of my mission more effectually to make special reports in detail to the trustees of the several sections who are in a position to remedy all matters complained of.

J. B. LUNDY, M.D.,
Medical Health Officer.

DUMFRIES SOUTH.

Medical Health Officer's Report.

In submitting to you my report for the past year it gives me great pleasure to state that the health of the township has been good; we have escaped all epidemics. The

fevers and throat troubles occurring at this season of the year have been to my knowledge absent. It is a satisfaction to state that the number of complaints have been few during the year, showing that the people of the township are seeing the benefit of keeping their premises in a clean and sanitary condition, thereby relieving the labours of your Board.

E. C. KITCHEN, M.D.,
Medical Health Officer.

DUMMER.

Secretary's Report.

The Chairman of the Local Board of Health has presented no report to council to date, no doubt through inadvertence. Council has not appointed a Medical Health Officer for the township. The Local Board has practically done nothing. I may state that as far as my knowledge goes the sanitary condition of the township for the year has been very fair. No unusual amount of sickness; no epidemic of a serious nature, such as typhoid, diphtheria, etc. A few have had the measles, with no serious results as far as I know.

WM. DARLING,
Secretary.

DUNGANNON AND FARADAY.

Secretary's Report.

I have the honour to inform you that the health of this municipality has been remarkably good during the whole of the year up to the month of November. Sore throat then became very prevalent, and at length a serious outbreak of diphtheria took place at the village of Bancroft and in its neighbourhood, and three deaths occurred. Our Reeve, Mr. D. Kavanagh, the Chairman of the Board of Health, went to the village and took steps to have the different residences disinfected where the sickness had been, and now, I believe, the disease is completely stamped out in this locality.

A. C. BARKER,
Secretary.

EASTHOPE, SOUTH.

Medical Health Officer's Report.

This municipality has been free from any infectious or epidemic diseases, generally so called, during the past year, with the exception of three cases of diphtheria and one of typhoid fever, which were imported from outside municipalities. Due precaution and disinfection having been employed, the disease did not spread. The general sanitary condition of the township and health of the people are good.

J. P. RANKIN, M.D.,
Medical Health Officer.

EDWARDSBURG.

Medical Health Officer's Report.

The Board of Health for this township has had no regular meeting this year. We have had no contagious diseases during the year, which may account for the Board not being called together.

S. C. McLEAN, M.D.,
Medical Health Officer.

EGREMONT.

Secretary's Report.

The Medical Health Officer reports nine cases of typhoid, supposed to be caused by impure water, other cases may have existed within the municipality but are not reported by other physicians. The members of the Local Board have regard to the sanitary requirements of each respective district, and any nuisances known or reported are immediately removed. The township is in a good sanitary condition.

DAVID ALLAN,
Secretary.

EKFRID.

Secretary's Report.

The Local Board of Health for this township met several times during the year. The only unsanitary condition calling for the interference of the Board was a slaughter house. It was proved by the evidence of parties that a nuisance dangerous to the public health was in said slaughter house, and the Board promptly served a notice on its owner to have it abated within three days of receipt of said notice. The party higgled a little trying to evade the law and the Board's mandate, but after coolly considering the matter he came to the conclusion that it would be better for him to clean up, which he did. The township is in a good sanitary condition and the health of the people excellent.

H. McFARLANE,
Secretary.

ELDERSLIE.

Chairman's Report.

This Board is pleased to report that during the past year no case of contagious or infectious disease has been brought to our notice, with the exception of one case of diphtheria. This is greatly owing to the circumstance that there are two incorporated villages within the bounds of the original corporation, and that the floating population, trades, and manufacturing industries that create nuisances are located in said villages. The school premises have all been kept in a proper state of cleanliness.

DONALD McINTYRE,
Chairman.

ELMA.

Secretary's Report.

In the beginning of the year all owners or managers of all cheese factories in the township of Elma, and the owners of all slaughter houses were notified by me, as Secretary, by order of the Board, that all cheese factories and surroundings must be kept in a clean and healthy state, and all slaughter houses must be removed the legal distance from all dwelling houses and public roads, and also kept in a clean and healthy condition.

The Board believe that everything was kept in a good state of cleanliness, as not one single complaint was made during the year.

The general health of the municipality during the year was very good. No infectious or contagious diseases of any extent occurred during the year.

The sanitary condition of the municipality is improving. A great deal of drainage has taken place throughout the township and greatly assists in taking away the surplus water which would otherwise (and did heretofore) remain stagnant.

THOS. FULLARTON,
Secretary.

ELMSLEY, NORTH.

Secretary's Report.

We have no Medical Health Officer appointed. The diseases prevailing here during the past year were typhoid fever and measles. The former caused three deaths. Cause supposed to be draining the water off the river to repair dams. The sentiments of the people are to assist the Local Board in anything regarding the welfare of the public health.

P. McKINLEY,
Secretary.

ERAMOSA.

Medical Health Officer's Report.

In presenting my annual report as Medical Health Officer for the municipality of Eramosa, I have again to congratulate you on the freedom of the district from any epidemic of infectious or contagious nature whatever, and that the sanitary condition of the township has been very good and is now excellent.

J. R. DRYDEN,
Medical Health Officer.

ERIN.

Medical Health Officer's Report.

In submitting this my second annual report I have very little to add to what I already sent you some weeks since. In the eastern part of the township a considerable number of cases of diphtheria have occurred but no deaths. In the northern part of the township I have treated nine cases with one death, but in neither instance could any defect be found as to the sanitary condition of the place. Seven of these nine cases were in one house and the other two were relatives of this family, and we believe it was

communicated by their visiting. One other case of diphtheria that is at present under my care, which occurred in this village, but I cannot attribute to the house in which patient lived the cause. Since I sent you a report of cases a few weeks ago, I have had one case only of typhoid fever, and I am of opinion that the cause in this case is traceable in part to carelessness of the family in disposing of refuse from their house, as well as from the very unsanitary condition of one of the neighbor's dwellings, about which I to-day have requested the Local Health Board to at once call a meeting to take steps to have same remedied. Measles, scarlet fever and whooping-cough cases have been exceptional.

A. H. MCKINNON, M.D.,
Medical Health Officer.

ERNESTOWN.

Medical Health Officer's Report.

In accordance with the Statutes, I have the honour to lay before you my annual report for the year 1887. The sanitary condition of the municipality during the year has been fairly good. There have been a few cases of diphtheria, also a few of typhoid in the township, but no deaths. In each case the patient was isolated and the spread of the disease prevented. I was only called on to make one inspection during the year. The proprietor of the cheese factory complained of has agreed to make all repairs necessary during the coming winter.

J. E. MABEE, M.D.,
Medical Health Officer.

ESQUISING.

Chairman's Report.

I beg to report, on behalf of the Board of Health, as follows :—

Having no medical health officer no official report of contagious diseases has been received during the year.

The Sanitary Inspector reports that the sanitary condition of the several villages of the township is good.

Physicians have made no report of contagious diseases attended by them. This is to be regretted, as it would conduce very materially to a more efficient discharge of the duties of the Board, and also be a reminder to the people of the necessity of care in preventing the spread of such disease. Moreover, in view of the fact that the dread disease, cholera, has appeared near New York, too much attention cannot be given both by the Council and the Board of Health during the ensuing spring, to have not only the villages of the township but all other places as well put in a proper sanitary condition, and thus prevent, as far as possible, the introduction and spread amongst the inhabitants of contagious diseases.

N. LINDSAY,
Chairman.

ESSA.

Secretary's Report.

I beg to state that there has been no epidemic prevailing in the township of Essa during the present year. There have been a few isolated cases of typhoid fever and

diphtheria, but none proving fatal that I have heard of. The township is well watered by creeks and rivers and never failing springs. No scarcity of good wholesome water has been felt in any part—one cause of our healthfulness.

J. W. Norris, M.D., is our Medical Health Officer. Our Board of Health is composed of some ten or twelve persons*, two of whom reside close together, and are chosen in the different parts of the township, so that no epidemic can arise without the knowledge of some member of the Board of Health. Our by-law lays down rules for the guidance of its members based upon the Health Act, and all the members of the Board are required to use all diligence in looking after the sanitary condition of his neighbourhood, and to report the first appearance of disease of an infectious nature.

R. T. BANTING,
Secretary of Board.

EUPHRASIA.

Secretary's Report.

The Board met on January 31st, 1887. Dr. Sproule was appointed Medical Health Officer. A resolution was passed that each member of the Board use all possible diligence in ascertaining the sanitary condition of the municipality, and report to the Medical Health Officer all knowledge that may be obtained regarding any case of small pox, scarlet fever, diphtheria, or typhoid, or any other infectious or dangerous disease within the municipality.

The Board met again on 3rd December, 1887, and four cases of typhoid fever were reported. One case was traced to stagnant water. One young man brought the disease from the United States. Three of these cases of typhoid fever were treated by our Medical Health Officer. No deaths. Several transactions in abating nuisances and burying of dead animals were reported at last meeting of our local board. We had a report also that Dr. Sproule, our Medical Health Officer, had made his report to the central board.

ROBERT DUNLOP,
Secretary.

FITZROY.

Medical Health Officer's Report.

As Medical Health Officer for the township of Fitzroy, I have to report the year just drawing to a close as an exceptionally healthy one in this district. The municipality has been free from contagious diseases, if we may except a few isolated cases of typhoid fever, one of which, I am sorry to report, proved fatal about the fourteenth day. The physicians in attendance used all the necessary precautions to prevent the spread of the disease.

Typhoid fever in this section generally makes its appearance in autumn, especially after very dry summers, but no season of the year is entirely exempt. The cases that exist at present have been attributed to the great drouth, which has not only reduced the quantity but injured the quality of the supply of water.

J. G. BAIRD, M.D.,
Medical Health Officer.

* The Chairman, Secretary and three Ratepayers are all that the Act requires to constitute a Local Board of a Township.—ED. REPORTS.

FLAMBORO', EAST.

Medical Health Officer's Report.

In submitting my report as your Medical Health Officer, I beg leave to congratulate you on the very healthy condition of the people of the township.

No contagious disease of a fatal character has been in our midst since my term of office commenced in August last. We have had a few cases of typhoid, but all of a mild type. No cause for the cases of typhoid was found, as far as I am aware. We have been exceptionally free from the dread diseases of diphtheria and scarlet fever, which have, on previous occasions, committed such ravages throughout the township. I would just like to make a suggestion, and that is, that some measure be taken to have funerals of persons dying with diphtheria, typhoid and scarlet fever, more private than I have noticed them. In many instances in other parts of our Province, public interments have been the agents in directly spreading disease.

I must also congratulate the Board on the extensive system of drainage that is being carried out in the swamp lands, in the centre of the township. The drying up of these lands, and so preventing the evaporation of water impregnated with the germs of malarial and other diseases, cannot help improving the health of the people in these districts. I earnestly hope the office of Medical Health Officer may prove as much of a sinecure in the future as it has done during my term.

J. D. COURTENAY, M.D.,
Medical Health Officer.

FLAMBORO', WEST.

Medical Health Officer's Report.

In accordance with the requirements of the by-law respecting Public Health, I beg leave to report that the number of cases reported during the year of scarlet fever was seventeen, all of which were of a mild form; typhoid fever, thirty-six cases; diphtheria, six cases, five of the last mentioned being from causes unknown and one from a filthy cellar. The laws respecting Public Health have, as a whole, been complied with, as the inhabitants highly appreciate the value of the Act. The only infectious disease at present are a few cases of scarlet fever of a mild form. The Sanitary Inspector reports that the municipality is in a cleanly condition, and that very few complaints have been made to him since his annual inspection, and that there is a general feeling in the municipality to comply with the requirements of the Act, as the inhabitants perceive the benefits accruing therefrom.

A. E. STUTT, M.D.,
Medical Health Officer.

FREDERICKSBURG, NORTH.

Secretary's Report.

At our first meeting of the Board we notified all owners of cheese-factories in our township that they would be required to comply in every particular with the Public Health Acts. We also had our Medical Health Officer inspect a portion of our township which had been visited by diphtheria, and to placard every house which contained contagious disease.

Complaints were made to the Board in reference to the sanitary condition of the cheese-factories, and we held a special meeting on June 20th.

We notified Mr. Woodcock to close his factory and place new vats so as to meet the approval of our Medical Health Officer, otherwise he would not be allowed to manufacture cheese in this township.

We also had Mr. McCargar disinfect a ditch where whey had been running into from his whey vat, which made a perceptible improvement about his factory.

There have been a few cases of diphtheria in the township, but not as many as the previous year.

As a whole, we think that this township is in a very good condition.

P. R. McCABE,
Secretary.

GAINSBOROUGH.

Medical Health Officer's Report.

The sanitary condition of the township has been good. We have had six cases of scarlet fever of a mild type, one typhoid case, quite a large number of cases of measles last spring, a few very mild cases of diphtheria; but no deaths have occurred from any contagious or epidemic disease.

I am not aware of any having been vaccinated within the township during the last year.

Five hundred copies of Schedule A, of Health Act, were distributed throughout the township. All complaints of unsanitary conditions were promptly attended to.

J. W. COLLVER, M.D.,
Medical Health Officer.

GARAFRAXA, WEST.

Chairman's Report.

The Board of Health for the township of West Garafraxa beg leave to present you with the following report for the current year. The sanitary condition of the municipality as a whole is in a fairly good condition. We have enjoyed almost perfect immunity from any infectious diseases, such as diphtheria, scarlatina or small pox, during the past year. Regarding the two cases of typhoid fever which have occurred in the municipality, they were confined to the one family affected. We have made every enquiry as to the source of water used in the house of those suffering from typhoid fever, but with no definite results. No doubt the intense heat of the past summer, coupled with the scarcity of water, were factors. All wells, not already cleaned out, should be attended to at once. We are not prepared to state the exact number of cases which have occurred, as no return has been furnished to the Board by outside medical practitioners of cases under their attention. Our attention was called to two nuisances, which we caused to be removed.

HARVEY CULL,
Chairman

GEORGINA.

Medical Health Officer's Report.

I beg to make the following report for the year 1887: With the exception of diphtheria, this township has enjoyed a blessed immunity from contagious diseases during the year now drawing to a close. I find, on reference to minutes, that our Board has met six times, five of which were *re* diphtheria. Cases of this disease were reported to us March 16, April 7, 12, and May 26. In point of time one would naturally conclude that

these cases arose from each other, or from a common source. Against this conclusion stands the fact that, with the exception of the last two cases, they were at different and widely separated parts of the township, not to mention the efforts we made to prevent contagion from spreading in each case. In all cases the Board placarded the houses, isolated the patients, and took all the other means recommended to prevent the spread of the disease. One case was, unfortunately, fatal, and here, the parents being poor, the Board conducted the burial, disinfecting, etc., at its own expense. We also had occasion to have a slaughter house removed outside the limits of the village of Sutton. We have to thank the medical profession for their co-operation in reporting cases promptly.

THOMAS B. BENTLEY, M.B.,
Medical Health Officer.

GLAMORGAN.

Secretary's Report.

Last year, just after the last report was sent in, this township was visited by diphtheria for the first time, coming in the family of a person who was from Fenelon Falls on a visit to relations. The house was immediately isolated, and, at the time stated, disinfected by the medical man, with the result that no spread occurred, and the child, the only one affected, recovered.

Two families at the opposite corner of the township also contracted it from another source. They were also promptly isolated, disinfected, and quickly recovered without loss. Since then the township has been visited by no sickness of any kind to call for notice. The population is 491, the death-rate being 8 per 1,000.

We had no Medical Health Officer nor Sanitary Inspector; the nearest medical man resides twenty miles off, which fact precludes a poor township employing one.

STEPHEN KETTLE,
Secretary.

GLANFORD NORTH.

Secretary's Report.

Very little business has been transacted by the Board during this year, as no complaints have been made as to the existence of anything that would in anywise endanger the health of any person, neither has anything of the kind been observed by any member of the Board. And as there has been no prevailing epidemic (save the measles and mumps in the early part of the season, which was of a very mild form, there having no case proved fatal, together with four cases of typhoid fever), we have reason to be thankful for the kind and merciful providence which has been exercised over us, and for the small amount of labour required of the Board. And as the sanitary condition of the municipality is at present extremely good, and should it remain so, very little labour will be required during the coming year.

THOS. CHOATE,
Secretary.

GLENELG.

Secretary's Report.

I beg leave to report that the Local Board of Health for the township of Glenelg met for the first time in the current year on the 31st day of January, and organized by

the appointment of a chairman and dividing the municipality on the basis of the polling subdivisions for the purpose of sanitary inspection.

I have much pleasure in reporting that not a single case of diphtheria, typhoid fever, or any other contagious or infectious disease, has existed in the municipality during the year.

In 1884 the several physicians practicing within the municipality were furnished with an ample supply of blank forms for reporting cases of contagious diseases. Up to the present time not one case of such disease has been reported, which fact speaks well for the sanitary condition of the municipality.

As no cases of contagious diseases have existed since the formation of the Board, no systematic routine of action has been taken by the Board for the removal of cause, or the isolation of cases; but the Board, being fully organized, is always prepared to take the necessary steps for the removal of cause and the isolation of cases, should such be reported.

J. S. BLACK,
Secretary.

GODERICH.

Chairman's Report.

The Board of Health for said township met at Knox's Hall, Holmesville, on Monday, the 12th December, 1887, and report as follows:

The school houses are all good (ten in number), well ventilated; a full supply of good water for each; the privies kept clean, and no complaint has been made to any member of the Board respecting any of them. There are numerous springs along the Maitland and Bayfield rivers, and through the interior of the township, of which the people avail themselves; but where wells have to be sunk, it is no unusual thing to go sixty feet—good water is then obtained. Last summer's drouth was very trying on the old wells, many of them giving out; these were either sunk deeper or replaced by new ones. There is not any contagious disease in the township. There is still a small percentage of careless people, and it is a difficult matter for the Board to deal with these, as no formal complaint is made by any person as to their unsanitary habits. They are becoming pretty well known to the Board, however, and it would be well for them to take a hint in time.

JOHN COX,
Chairman.

GLOUCESTER.

Secretary's Report.

The sanitary condition of the township of Gloucester during the last year has been very satisfactory to the Local Board; no epidemics nor contagious diseases are known to have existed, with the exception of a few isolated cases of diphtheria among children, for the origin of which we can assign no other reason than some domestic irregularity or neglect beyond the reach of our Sanitary Inspector.

I would also state that no malarial diseases whatever have been reported, or known, to the Local Board, which may be attributed greatly to the excellent Drainage Act of the Ontario Legislature passed in 1883. Our proximity to the city of Ottawa has entailed upon our Sanitary Inspector and the members of the Local Board individually, a very large amount of vigilance in order to prevent the transportation of dead animals, night soil and garbage into the township from the city, to the prevention of which may be attributed a great portion of the freedom from disease which exists in the township, and

to the retention of which in the city may be attributed largely the epidemic of typhoid which exists at the present time.

The inspecting of slaughter houses has taken up a considerable portion of the time of the Inspector, in which he has been under the necessity of bringing several parties before the local justice courts to be summarily dealt with.

In connection with this matter I would beg leave to suggest, that the practice which prevails of converting our rivers and streams generally into common sewers, by the erection of slaughter houses and tanneries along their banks, and using the same as depositories and dump-grounds for offal and offensive matter of every description, is very objectionable, and should be prevented by an Act of the Legislature.

C. BILLINGS,
Secretary.

GREY.

Secretary's Report.

In compliance with the Public Health Act, I have the honour to report to you that the sanitary condition of this township for the past year has been excellent. No nuisances of any kind have been reported, and the work of the Board has been light. With the exception of a few cases of measles, the municipality has been entirely free from any disease of a contagious nature.

WILLIAM SPENCE,
Secretary.

GRIMSBY NORTH.

Chairman's Report.

The Local Board of Health for the municipality of the township of North Grimsby for the year 1887, beg leave to report as follows: That the sanitary condition of the municipality has been marked by the almost entire absence of infectious diseases, only two cases having been reported by the medical authorities, that of scarlet fever in different dwellings on the same farm, both of which were promptly placarded, neither case proving fatal, and the disease not communicated to any others in the vicinity.

A. G. MUIR,
Chairman.

GRIMSBY SOUTH.

Medical Health Officer's Report.

During the past year there has not been one case of contagious disease reported to this Board.

There has not been any epidemic of any kind during this time in this municipality, so that it affords me great pleasure to report so favourably on the sanitary condition of the township.

D. McMURCHIE, M.D.,
Medical Health Officer.

GUELPH.

Chairman's Report.

The sanitary condition is satisfactory. Very few cases of infectious disease reported, and these of a mild type of diphtheria. No deaths from this cause reported during the year.

Few complaints were made, and those made were attended to with satisfactory results. Twelve dead animals were reported during the year, namely 5 horses, 2 dogs, 2 pigs, and 3 sheep. All were removed to the city nuisance ground and properly disposed of, at a cost of sixteen dollars to the township.

During the summer months two horses and a number of cattle died suddenly on the farm occupied by Henry Dawson, on the river Speed. The cases, examined by Dr. Green-side, were pronounced anthrax. Some blood taken from one of these was sent to the Provincial Board of Health, Toronto, for examination, and by them declared to be anthrax. Your Inspector ordered the bodies to be cremated, as the only sure means of destroying the germs. What to do in the matter of the prevention of anthrax is still under the consideration of the Provincial Board and the Minister of Agriculture.

THOMAS McCRAE,
Chairman.

GWILLIMBURY EAST.

Secretary's Report.

A number of cases of contagious diseases have occurred during the year, a large proportion of which were reported by the medical attendants to the Board, and the latter at once caused the necessary public notices to be posted in front of the dwellings infected.

In order to obtain the fullest information possible as to the number of cases occurring during the whole year, a circular was sent by the Secretary of the Board to all practicing physicians in or near the limits of the township asking for a definite statement of all cases attended by each of them and the attendant results. The following returns were made:

Diphtheria, 31 cases, 4 deaths; typhoid, 10 cases, 2 deaths; scarlet fever, 3 cases; parotitis, 16 cases.

All complaints relating to the existence of nuisances were attended to at once.

The present sanitary condition of the township is most satisfactory, there being an almost entire absence of any contagious disease.

A. J. HUGHES,
Secretary.

HAGARTY.

Secretary's Report.

I have to report that there have been no contagious diseases in our municipality for the past year. We had no Medical Health Officer, but we will have an opportunity in the year 1888 of having Dr. James, of Brudenell, as Medical Health Officer, and we will elect our officers immediately, as we are in direct communication with Ottawa City, where the fever is bad.

T. ROCHE,
Secretary.

HALDIMAND.

Medical Health Officer's Report.

In taking this opportunity of submitting for your consideration the health report of the township of Haldimand for past year, I must congratulate you on the result of your labors. In comparison with many municipalities, we have enjoyed remarkable immunity from epidemics of contagious or infectious disease, and although reports from some parts of the township indicate that there is yet work to be done by this Board, nevertheless the hygiene of the municipality as a whole is in a very satisfactory condition.

Occasional cases of a sporadic nature have arisen in some localities, but have, by efficient sanitary laws, been prevented from developing into any serious epidemic.

Two cases of typhoid fever at the "Patterson House" here in the early part of January last, were produced from causes which were evident—proximity of the well of drinking water to the privy and barn together with decomposition of vegetable matter in and about the buildings, were undoubted causes of the disease. These causes have been removed and a perfect sanitary state of affairs adopted.

A case of diphtheria occurring in the house of one Wm. Roberts, Benlocke, near Wicklow, also produced by an unsanitary condition of house and surroundings. Prompt attention to the unhealthy state of affairs prevented any spread of the disease.

Typhoid fever also existed in that locality known as Eddystone, but as far as reported only one case existed, and sufficient cause for producing the disease was found in the decaying animal and vegetable matter, as well as the filthy condition of the yard and locality adjoining the house.

Occasional reports from farther north in the township show that diphtheria and scarlet fever have existed in a mild degree, but much less than during previous years.

From the whole township the reports are decidedly better than for any previous year.

W. W. BOYCE, M.D.,
Medical Health Officer.

HAMILTON.

Chairman's Report.

It is with pleasure that I can report to you that the inhabitants of this municipality have been blessed with good health during the present year, so much so that your Local Board of Health has had no reason to call a meeting of the Board during the year, except the statutory meeting last January.

There has not been one case of contagious disease within the limits of your municipality during the year. The sanitary condition of your township is in a comparatively good position, fair attention having been given to the requirements of the Public Health Act by the people generally.

You will be required at the last meeting of the present council to vote such sums as are deemed necessary by the Local Board for the carrying on of its work.

We did not think it was necessary to appoint a Medical Health Officer and did not require one.

JOHN BOWMAN,
Chairman.

HARVEY.

Secretary's Report.

The general health has been good with the exception of one family. A cousin of theirs who had been ill with diphtheria, came on a visit from Verulam Township adjoining, and the family caught the disease from him.

They lost one child after four days' illness, about three weeks ago and buried it at midnight. The school was closed immediately after it was found out what the disease was.

The medical practitioner reported to the Local Board of Health the existence of diphtheria within our municipality. We immediately posted a notice on the premises, and warned the people to keep away.

Five more of the children were taken down soon after the one that died. The doctor reported yesterday that two of the last named had recovered, and the other three were about out of danger.

The family have been using disinfectants, viz., mercuric chloride, carbolic acid, chloride of lime, sulphur, etc., all along, and the sick ones are kept in the upstairs chamber. We are in hopes that the disease will be stamped out without spreading in the neighborhood.

JAMES S. CAIRNDUFF,
Secretary.

HAWKESBURY WEST.

Medical Health Officer's Report.

Allow me to submit the following report upon the state of the public health for the current year :

The general health of the municipality has been good, with the exception of a few cases of diphtheria in the early months of the year and one case of typhoid fever this fall. The township is now free from contagious diseases. During the summer months there were the usual summer complaints among children, and with the exception of a few cases which proved fatal the type was mild.

In regard to the sanitary condition, the Sanitary Inspector made an inspection last spring and attended to all the complaints during the summer.

D. J. MCINTOSH, M.D.,
Medical Health Officer.

HAY.

Medical Health Officer's Report.

In compliance with the requirements of the Public Health Act, I beg leave to lay before you the following report of the general health and sanitary condition of the township of Hay for the year 1887 :

In the early part of the year several cases of diphtheria occurred, most of which were of a mild type, but two were sufficiently severe to prove fatal. During the summer and autumn months twelve cases of typhoid fever occurred, seven of which were in the village of Zurich and five among farmers. All the cases of typhoid fever recovered. A few cases of measles were also reported, which presented nothing unusual, and all recovered ; so that from these three contagious diseases, so far as I know, only the two deaths above noticed occurred during the year.

In regard to the sanitary condition of the township, I am happy to state that it is much better than formerly. Farmers are building larger and better dwelling houses, and paying more attention to having them properly ventilated. They are also clearing up and draining many swamps, marshes and pond-holes, in most of which stagnant water stood during the greater part of the summer. This, in connection with a thorough system of underdrainage of lands under cultivation, will, I think, in time have a very beneficial effect on the general health of those engaged in agricultural pursuits. There is one custom that I think should be mentioned, and perhaps more protested against than it is, and that is the very common practice of storing large quantities of roots and vegetables in the

cellars of dwelling houses, for it is difficult to think of a more fruitful source of disease than decaying potatoes, apples, cabbages and turnips in a damp and ill-ventilated cellar during the warm months of spring and summer, especially when we consider that many of these cellars are not properly cleaned out or disinfected once in four or five years.

G. BUCHANAN, M.D.,
Medical Health Officer.

HIBBERT.

Secretary's Report.

I have much pleasure in reporting that the township of Hibbert has enjoyed, as far as I know, a perfect immunity from any disease of an epidemic nature so far during the current year. Complaint was made to the Local Board of Health that the premises of a butcher in Dublin village required attention. This was inspected and found in a condition not entirely satisfactory, there being some bones and offal exposed, from which emanated an offensive smell; they were ordered to be removed and buried. In consequence of further complaints from the same quarter, the Medical Health Officer was called upon to inspect the premises, and the remedies suggested by him having been carried into effect, no further trouble was experienced. In the early part of the month of May it came to the knowledge of the Board that the carcasses of some animals were left unburied in a few localities of the township, but on being notified that the law would be put in motion to punish the offending parties, they were promptly put out of sight. Nothing else came under my notice calling for further remark.

T. CARROLL,
Secretary.

HOPE.

Chairman's Report.

The chairman and members of the Local Board of Health beg leave to report that there is no epidemic in the municipality of Hope at present. There was one case of diphtheria in the spring, but the family was isolated and the premises disinfected, thus preventing the spread of the disease. The Inspector reports the several slaughter houses and cheese factories as kept in accordance with the provisions of the Public Health Act, and also in accordance with By-law No. 454 of this municipality. All of which is respectfully submitted.

E. A. POWERS,
Chairman.

HULLETT.

Medical Health Officer's Report.

From the first of November, 1886, to the end of April, 1887, was marked by a great many cases of sore throat, which was of an epidemic character, but in no case, as far as has been ascertained, did it prove fatal. July, August and September we had a few cases of typhoid fever. Sanitary measures were strictly attended to and spread of disease prevented. During October and November measles have been very prevalent through the township, but in no case has death been reported from them.

O. YOUNG, M.D.,
Medical Health Officer.

HUMBERSTONE.

Medical Health Officer's Report.

No deaths have occurred in Humberstone from preventable diseases during the year so far. The number of deaths from all causes this year is small. Some three or four families have been attacked with scarlet fever in a mild form, but still the typical disease, which ended favourably under medical treatment. The isolation and disinfection resorted to prevented their spread. About the same number of cases of diphtheria have been reported to our Board; none of these cases were fatal, they were of a mild type; isolation and disinfection were adopted. This is about the extent of our zymotic diseases this year. Sanitary conditions are improving in our township to some extent. Old stagnant water pools are being got rid of; drainage is doing a good work, and nuisances, as soon as detected by any of the members of our Board, are quickly disposed of. Privy-pits are not allowed to fling their pestiferous stench, as formerly, in the face of the community without remonstrance. Their owners are instructed to disinfect them frequently with lime and kindred agents. The three slaughter houses in the township have been inspected by our officers; they are disinfected and kept clean. We have one vendor of milk who keeps his stables disinfected, feeds his cows on hay and chopped grain; he sells his milk to private citizens. Our people are becoming more alive to sanitary affairs. They do not now think they are a hardship and disconnected with their health and well-being. Our Board hope our people, including themselves, will, as time goes on, acquire more knowledge of the laws of sanitation.

M. F. HANEY, M.D.,
Medical Health Officer.

INNISFIL.

Secretary's Report.

I have to report that the sanitary condition of the municipality of Innisfil is good, so much so that the Medical Health Officer makes no report on account of having nothing to make a report upon.

CHARLES PALLING,
Secretary.

KINCARDINE.

Medical Health Officer's Report.

In presenting this my annual report as Medical Health Officer, I must congratulate you upon the excellent sanitary condition existing in the township of Kincardine. Under the circumstances I did not deem an extended inspection necessary, and therefore made none. In conclusion, I am happy to be able to state that I am not aware of the existence of any remediable unsanitary condition in the township to which I could draw your attention.

THOS. BRADLEY, M.D.,
Medical Health Officer.

KING.

Secretary's Report.

It affords me much pleasure to report that no contagious diseases of any kind have made their appearance during the current year, and the municipality is at present in good

sanitary condition. The services of the Health Inspector were required on two occasions only during the year.

JOSEPH WOOD,
Secretary.

KINGSTON.

Secretary's Report.

As regards the sanitary condition of the township of Kingston I have simply to say that it is good as far as known. The difficulty we had with a party in the early part of the season has been satisfactorily arranged and the nuisance abated. There has been no outbreak of any infectious disease, and have every reason to believe the health of the township of Kingston was never better.

JOHN SIMPSON,
Secretary.

KINLOSS.

Medical Health Officer's Report.

I have the honour to inform you that during the year just ended your township has been in a comparatively healthy condition. With the exception of a very mild form of measles, which from reports has appeared very general throughout the township, I have heard of no other infectious diseases. I would call your attention to the fact, however, that some of the schools in the township are very much overcrowded and would recommend that the several boards of trustees be requested to provide a better system of ventilation, and that the surroundings of the school, with their out-houses, be put in a proper sanitary condition.

The removal of the slaughter house at the west of the village of Lucknow, by order of the Board, was the means of removing a public nuisance and a probable cause of typhoid fever.

The Board certainly deserve the highest praise and the thanks of the residents of the township, for should an epidemic of any infectious or contagious disease appear among them they are now in a position to prevent, as far as possible, the spread of such disease.

JNO. S. TENNANT, M.D.,
Medical Health Officer.

LANCASTER.

Secretary's Report.

The Local Board of Health of the township of Lancaster, in session assembled this day, beg leave to submit the following annual report as to the sanitary condition of this township for the year 1887 :—

With the exception of a severe outbreak of pneumonia last spring the township has been in a very healthy condition. Very little Canadian cholera, no typhoid fever nor other infectious diseases, with perhaps the exception of a few cases of diphtheria which occurred during the last month, and these cases, we have good reason to believe were contracted in a neighbouring township.

A. E. McRAE,
Secretary.

LEEDS AND LANSDOWNE (REAR OF).

Secretary's Report.

As there was no Local Board appointed this year until about two weeks ago, I have no tabulated reports to make, nor have I received any from the Chairman or Medical Health Officer.

We have had diphtheria of a very mild type in one family here about two weeks ago; all attacked are convalescent. The disease has not become epidemic, but care was taken that it should, if possible, be confined to the one house. The Board authorized me to ask for blanks to supply to physicians, also for blanks to make reports. I have not heard of any measles, typhoid fever or other contagious diseases beyond what I have reported.

JAMES BERNEY,
Secretary.

LOBO.

Secretary's Report.

The Board met and organized and appointed Alex. Campbell, Chairman. The Board attended to any matter that came under their notice. There were no cases of any dangerous contagious diseases this year in our municipality. The work of the Board has been very light this year. The general sanitary condition of the township is very good.

E. R. BARCLAY,
Secretary.

LOCHIEL.

Medical Health Officer's Report.

In submitting my report to the Board of Health upon the sanitary condition of the township, I cannot refrain from expressing congratulations for the immunity from contagious and infectious diseases enjoyed for the past year.

The only disease of the above nature which has existed within the township since the organization of the present Board of Health, is diphtheria, and of this disease seven cases and one death occurred.

As you will see, we have enjoyed almost entire freedom from those dread diseases which usually create such havoc in a country.

In order that this freedom from disease, which owe their origin to the accumulation of filth of any nature in which decomposition may occur, may be maintained, I would recommend that before the cheese season will open next year (1888), some measures be adopted by the proprietors of factories for the prevention of cesspools beneath the factory floors, and that beneath two or more cheese factories in the township, where there are now cellars partially filled with whey and such refuse, something will be done to remove the same before the frost disappears next spring, and the said cellars be subjected to a thorough disinfection.

To the Board of Health which will be in existence then, I heartily recommend that this very important matter will be attended to, and thereby remove what might cause a serious epidemic.

L. McMILLAN, M.D.,
Medical Health Officer.

LONDON.

Medical Health Officer's Report.

During the term of my office since February 7th, there have been thirty-nine cases of diphtheria and only three deaths. Nine of the cases were traced to unsanitary conditions for their origin; but as to the remainder nothing definite regarding cause is known. There have been some other cases attended by other practitioners and not reported, but we are now insisting on the reporting of all cases and placarding all houses in which is found the disease.

The general sanitary conditions of the township are good. For prevention of spread of disease we use isolation and disinfection, and are doing what we can to render these efficient in stamping it out.

GEO. SHOULTS, M.D.,
Medical Health Officer.

LUTHER WEST.

Secretary's Report.

I beg to report that the health of this township has been so good that there has been no necessity for calling the members of the Board together. There was but one case of typhoid fever, and was contracted by a person who lived almost next door to the Medical Health Officer, and was attended to by him. I saw the person frequently myself and arranged with the Medical Officer to thoroughly disinfect the house. No other person in the house or in the little village took the disease. The patient is fully recovered.

JAMES McLACHAN,
Secretary.

MAIDSTONE.

Medical Health Officer's Report.

In compliance with the requirements of the Public Health Act, I have the honour to lay before you my annual report.

The sanitary condition is good, and the Board is prepared to combat contagious diseases at the earliest invasion. Seven cases of diphtheria with one death, and fourteen cases of measles with no deaths, include all the contagious diseases for the year.

Zymotic diseases have been much less prevalent than formerly, owing in part, I think, to greatly improved drainage.

S. RICHARDSON, M.D.,
Medical Health Officer.

MALDEN.

Medical Health Officer's Report.

I beg leave to present my annual report to the Board of Health for this year. Although a good deal of sickness has prevailed during the year, yet it has not been so generally extended as in former years, and this is, no doubt, owing to the salutary efforts put forth by the Board of Health.

Of the zymotic diseases, I may say an epidemic of measles prevailed somewhat extensively the early part of the year, resulting generally in recovery.

Three cases of diphtheria of a malignant type. The origin could not be traced, yet, by carrying out the principles of notification, isolation and disinfection, it was prevented spreading to any other family.

When we remember that Asiatic cholera has prevailed with such terrible fatality in the Mediterranean ports last summer, and even this fall was brought to New York, so it is impossible to foreshadow what another summer may bring forth; hence the old motto, and a very true one, which should be a motto for every Board of Health, "An ounce of preventative is worth a pound of cure." I would strongly advise the Board, this spring, to thoroughly have all wells and outhouses in a perfect sanitary condition.

T. JAMES PARK, M.D.,
Medical Health Officer.

MARKHAM.

Secretary's Report.

The Board of Health this year have nothing to report further than we met and organized, with the Reeve of the township as chairman. I have had some five or six cases of diphtheria reported, which were at once isolated by the medical men in attendance, and did not spread. At present we have no cases of any kind of diseases that are contagious, and so far have not had a meeting of the Board since the opening meeting in January last.

JOHN STEPHENSON,
Secretary.

MARIPOSA.

Medical Health Officer's Report.

The past year has been marked by some improvement in sanitary affairs in this municipality. The report of the Inspector shows that he has been doing good work, in keeping up the standard in all matters relating to public health regulations.

He has made 190 domiciliary visits, besides inspecting our public schools, cheese factories, and slaughter houses, and has had, as far as possible, the Public Health Act carried out.

I have advised him to see that in all cases where new privies are needed or are about to be built, to discredit as much as possible the old plan of building over an earth vault, and recommending or insisting on the use of the dry earth system. The Inspector reports a number of privies not more than twenty feet from wells now in use. This state of things, I think, should not be permitted, as some of the excreta is sure to find its way into and contaminate the water.

The Inspector also reports considerable negligence in the matter of water supply, the people, in a great many instances, not appreciating the importance of being positive as to the purity of the water used for drinking and household purposes. He finds it necessary, very often, to use a great deal of persuasion, sometimes of an urgent character, in order to secure any response to his authority for having wells cleaned.

The Inspector also makes complaint of the inefficiency of the cellar drainage of many houses in the village of Oakville; he states that the main drain has no outlet—a queer drain—being dug for a certain distance and ending in a blind extremity. I would say that such a condition was as bad, or perhaps worse, than no drainage at all; would not water, backed up in those cellars and standing still in those drains, be a splendid nidus for the typhoid fever germ, or the special virus of diphtheria; by all means that drain should be completed.

During the year there has been reported six cases of typhoid fever, five of which recovered; five cases of diphtheria, four recovered; three cases of scarlet fever, all recovered.

According to the above showing the efficiency and usefulness of our Local Board of Health is evident, inasmuch as having the germs of those three very contagious diseases among us, yet, by proper precautions and sanitary regulations, they have been kept within those small dimensions. The above results are the more conclusive when we remember the very dry season we have had, with its consequent scarce and impure water supply, which would of necessity aggravate many of the causes of disease.

A. E. VROOMAN, M.D.,
Medical Health Officer.

MARYSBURGH NORTH.

Chairman's Report.

We, the members of the Local Board of Health for the township of North Marysburgh, beg leave to submit our annual report, as follows:—

We are pleased to report that the township of North Marysburgh is free from all contagious diseases, excepting a few cases of measles recently reported, and the sanitary condition is considered as satisfactory, as far as we can ascertain.

Owing to the absence of the Medical Health Officer, and from the fact that his professional services has not been required during the year, we have no report to send from him.

B. H. HARRISON,
Chairman.

MELANCTHON.

Secretary's Report.

The Board of Health for the township of Melancthon beg leave to report that the general health of the township for the past year has been good, with the exception of about ten isolated cases of diphtheria; three of them were fatal. There was one imported case of typhoid fever, which terminated fatally. I am not aware of any case of scarlet fever, mumps, or other contagious disease, during the year.

JAMES BROWN,
Secretary.

METCALFE.

Medical Health Officer's Report.

I have much pleasure in submitting to you my annual report as Medical Health Officer for the township of Metcalfe for the year 1887. I have to congratulate you on the sanitary condition of the township in general. It is a matter of thankfulness that during the past year our township has not been visited by any widespread cause of mortality or sickness, beyond the ordinary causes that are at work from year to year, over which we have no control. The sanitary condition of the township has been during the year in such an excellent shape as to render a lengthy report from me quite unnecessary. In diseases of an infectious nature we have had only a very few cases of whooping cough, scarlet fever, and a very mild form of diphtheria, all of which recovered.

A. NIXON, M.D.,
Medical Health Officer.

MIDDLETON.

Chairman's Report.

I beg leave herewith to report to you upon the sanitary condition of the township during the past year.

There has been very little to which the Board of Health of the township has been referred.

There have been about nine cases of diphtheria brought to the notice of the Board of Health, five of which proved fatal. Every precaution has been observed in checking the disease, and at present no symptom of any serious disease is known to exist.

ROGER CRYSLER,
Chairman.

[The report of the Medical Health Officer is withheld owing to its being simply a statement as to the correctness of the Chairman's report, as given above.—ED. REPORTS.]

MINTO.

Medical Health Officer's Report.

During the past year no report has been made to us by any practitioner of the presence of any infectious or contagious disease within the municipality, and, so far as I know, there has been nothing calling for special action on the part of the Board. I visited the different cheese factories and invariably found them kept clean, and, as much as possible, free from disagreeable smells. The piggeries in connection with them have been, and many are yet, the cause of complaint. I do not see how the recommendations of the Provincial Board of Health regarding the registration of those supplying milk to parties can be carried out without unnecessary expense, which I do not feel like advising the Board to incur.

A. HARVEY, M.D.,
Medical Health Officer.

MOORE.

Secretary's Report.

In compliance with the Public Health Act, 1884, I beg to report that at the first meeting of the municipal council of the township of Moore for the present year a Local Board of Health was appointed, with Dr. Wilkinson, of Mooretown, as Medical Health Officer.

As this is a rural municipality, contagious or infectious diseases do not spread so rapidly as when the population is denser, and, therefore, comparative immunity from such diseases has been enjoyed during the year. Still, several fatal cases of diphtheria and typhoid fever have occurred, and some cases of measles and scarlet fever have been reported by medical practitioners in the township. Seeing that a virulent case of diphtheria or small pox is more to be dreaded in a community than the prowling dynamiter, a wide field for watchfulness and usefulness is here offered for the proper energies of Boards of Health in promptly adopting precautionary measures to check the spread of such diseases, and, if possible, ascertain their original or exciting causes.

It is to be feared, however, that Local Boards of Health are generally not more attentive to the duties devolving on them in this respect than is necessary, and that this Board is no exception to the general rule.

JAMES WATSON,
Secretary.

MORNINGTON.

Secretary's Report.

The Board met on the 14th of February, when the following members were present : Wm. B. Freeborn, Reeve ; J. Watson, Clerk ; Jacob Kollmann and James Boyd. Mr. Kollmann was appointed chairman. The nuisance at the cheese factory on the seventh concession was brought up and discussed and laid over to the next meeting. The nuisance was abated, and no more action taken in the matter. In regard to sanitary work, there has nothing been done during the year but the discussion of the above question, and of the sanitary condition of the township the Board knows very little, as the medical practitioners have never made any returns of infectious or contagious diseases.

The Board met again on the 5th of December, when the members were all present. The Medical Health Officer, Dr. Johnson, reported in the early part of the year that there were several cases of malarial fever, besides a few cases of diphtheria later on, which were confined to the families with whom the disease originated, by the judicious procedure of isolation, disinfecting, etc. Thus the disease was stamped out.

JOHN WATSON,
Secretary.

MORRISON.

Secretary's Report.

In accordance with the statute, I beg to present the annual report of the Local Board of Health of the municipality of Morrison, and say, that the health of the township has been good throughout the past year ; for instance, during the last six months only three deaths have been registered.

There have been no symptoms of epidemics, even of infantile diseases, such as whooping cough, measles, or scarlatina ; and, as stated in the chairman's report to the township council, the individual members of the Board are keeping watchful and vigilant and are thoroughly impressed with the importance of the duties connected with their office.

THOMAS WHYTE,
Secretary.

MCKELLAR.

Medical Health Officer's Report.

In accordance with the provisions of the Public Health Act, I beg to present my annual report.

It is thought by some that because we do not live in a town where, on account of the assemblage of a large number of people within a limited space, the consequent difficulty in disposing of sewage is more apt to breed disease, and that the duty of a Board of Health in a village is of small consequence. But I would desire to remind you that the laws of nature cannot be violated with impunity any more in a village than in a densely populated town, and that the lives of villagers are of just as much value as those of town-folk. Epidemics of diphtheria and typhoid have often ravaged country places. I have therefore felt it my duty to be as particular here when an unhealthy condition exists, as when I was Medical Health Officer in a town.

The Inspector and myself have endeavored to carry out the provisions of the Act with as little inconvenience as possible to the ratepayers, and, except in one instance, have found their common sense has caused them readily to accept our suggestions and willingly to carry them out.

In one instance, however, where a privy was situated upon the lake shore, the proprietor was inaccessible to moral suasion, and I was compelled reluctantly to enforce the law or to resign my office. I did the former.

There is now no offensive drainage into the lake. Two or three surface drains have been made at some expense to the owners, and, as upon examination I have found the contents harmless to health, I have not deemed it necessary to interfere with them.

With regard to the bodies of dead animals which have been thrown aside during the winter and become offensive in the spring, I have ordered immediate burial as soon as the nuisance was discovered.

I am glad to inform the Board that, to my knowledge, there has not been during the year within this locality a single case of infectious disease.

I am well satisfied with the assistance given me by the Inspector, Mr. Spencer.

BRINSLEY M. WALTON, M.D.,
Medical Health Officer.

McKILLOP.

Medical Health Officer's Report.

The honour of submitting an annual report devolves upon me for the year 1887.

During the year the board held three meetings, and although the executive work was not important, still you have paved the way for future sanitary usefulness.

As you are aware the only nuisance of any moment that engaged the attention of the board was that of Winstrop, and the deep interest taken in it leaves no doubt of its early removal. The early part of the year was marked by an outbreak of measles, which spread over a considerable portion of the municipality, one death reported.

In May an outbreak of scarlet fever occurred in the eastern part of the township, which necessitated the closing of the school in that section for a limited time.

The germs of the disease were brought from a distance. I regret to report that the first case was not properly diagnosed, as the physician who attended pronounced it "an unique case of rheumatism with rash." The disease spread to five families, attacking twenty children in all; one death occurred from a complication. In July, August and September we had numerous cases of dysentery and a few isolated cases of typhoid. During the same period two cases of diphtheria were reported, one death.

Thus we see that our municipality is not exempt from filth generating diseases. However, considering the lengthened period of dry and hot weather, we have every reason to be grateful for the low death-rate of the municipality.

Gentlemen, your work as a sanitary board is a noble one, and will in a few years be more appreciated than it is at present; for in the words of Sir Wm. Jenner, "to prevent disease is the highest and most important aim of the science and art of medicine."

Judging from the progress that sanitary science has made in the last few years, I can safely predict that in the near future zymotic diseases in Canada will be rare.

WM. HANOVER, M.D.,
Medical Health Officer.

McLEAN.

Secretary's Report.

It is with unfeigned pleasure that I have to announce that the sanitary condition of this municipality is superior to anything that can be imagined by one nurtured in a city:

No vegetable or animal matter is allowed to decompose and exhale its noxious gas, for such is forthwith buried or used to enrich the soil of the vegetable garden.

The consequence is, disease is a rarity in this salubrious region.

To be brief, our sanitary arrangements are perfect. May they continue so.

ANDREW SLEMMONT,
Secretary.

McNAB.

Secretary's Report.

There has been no need of enforcing any sanitary measures during the year, as the sanitary condition of this municipality so far as known or reported to the board is excellent. There has been no cases of contagious diseases.

I beg to state that we have no Medical Health Officer engaged, for our local board is of the opinion that at the present time and under the present circumstances a health officer is not required.

J. D. McNAB,
Secretary.

NEEBING.

Medical Health Officer's Report.

I have the honour to present you with my first annual report as Medical Health Officer of the Town of Fort William, and I can assure you that it is a matter of congratulation that Fort William, acting upon the recommendation of the Provincial Board of Health, has established a local board to look after the sanitary interests of the municipality.

Former experience has taught the value of health committees for the prevention of the spread of contagious diseases, and if this board shows due vigilance and enthusiasm it cannot but stimulate confidence and emulation on the part of the people who are benefited. In rural districts we do not have to face in a great degree the baneful effects of deficient sewerage and want of good drinking water, but in the disposal of garbage, etc., we are subjected to the same influences as people in cities and large towns.

In the erection and arrangement of rural dwellings, I beg to point out that more attention should be paid to the following points:—

1. Better drainage from cellars and foundations.
2. Greater distance between dwellings and privies.
3. If there must be a garbage pile, to have it at a safe distance from dwellings and removed at stated intervals.

In the matter of prevention of the spread of contagious diseases an important factor is the power of masters in schools, and I would recommend that the attention of teachers be called to the school law which enacts that "the masters of every school shall see that no pupil is admitted to or continues in any of the schools who is affected with or has been exposed to any contagious disease, until all danger of contagion from such pupil or from the disease or exposure shall have passed away, as certified in writing by a medical man."

In rural places no one perhaps is more cognizant of the prevalence of disease than school teachers, and by their co-operation (which is compulsory) much may be done to prevent their spread.

I am pleased to state that very few cases of contagious or infectious diseases have been reported during my term of office, which goes to prove either the excellent sanitary condition of the municipality or gross negligence on the part of those who should report, the former being evidently the factor.

A few cases of scabies and scarlet fever occurred under my own observation, which were isolated cases. Being of a mild type, no deaths occurred.

In one or two cases only have we been called upon to insist that sanitary matters should be improved. One, the slaughter-house on the bank of the Kaministiquia river, where slaughtering has been done, the effete matter runs down the bank into the river and the water is used afterwards for drinking purposes. The slaughter-house was ordered to be closed.

W. H. HAMILTON, M.D.,
Medical Health Officer.

NEPEAN.

Medical Health Officer's Report.

In compliance with the requirements of the Public Health Act, I beg to submit the following report of the sanitary condition of the Township of Nepean for the current year : It was a matter for congratulation, that during the fore part of my term of office—which began in June last—the township was in a remarkably healthy condition, there being no epidemics or widespread cases of sickness or mortality.

I regret, however, to have to report a much less favourable state of affairs during the latter half. In addition to the usual number of ordinary cases which we generally find prevalent during the summer and autumn, we have had a number of cases of a more serious nature.

In the month of September, eight cases of diphtheria occurred in the Village of Merivale, one of which proved fatal. On enquiring it was found that the disease made its appearance in two families simultaneously. The source of infection cannot be definitely traced, although there are strong indications that both families contracted the disease while attending Barnum's circus in Ottawa a few days (3 or 4) previously.

With the exception of a third family, a number of which became infected before the nature of the malady was made known to them by a physician, it was strictly confined to the two houses, by having them isolated and the houses afterwards thoroughly disinfected and fumigated.

From my own knowledge, and from such information as I am enabled to obtain from other city physicians, I am satisfied that the number of typhoid fever cases (in the suburbs of the City of Ottawa particularly), has been large. Some of them have been very severe and of long duration, although the actual number of deaths has been small.

Active measures have been taken in the matter of nuisances, and as a result the glue factory, which has long been a source of annoyance and very great danger to the lives of the inhabitants of Rochesterville, has, after considerable trouble, been compelled to cease working. Our attention at the present time is directed towards abating the nuisance created by the depositing of city night-soil upon the farm of Mr. Holland.

After a thorough inspection accompanied by the health officer of the locality, and adapting the method employed in disposing of the material, I at once authorized Mr. Gordon to notify the offending parties and have the nuisance immediately stopped. What the outcome of our efforts is remains yet to be seen. However I have every hope that we shall experience little trouble in the discharge of our duty, and that before many days have elapsed the nuisance will no longer exist.

W. FENTON GRAHAM, M.D.,
Medical Health Officer.

 NIAGARA.
Secretary's Report.

Our township Board have never appointed either a Medical Health Officer or Sanitary Inspector, consequently I cannot send a report from either of them.

This municipality has had only one case of typhoid fever that I have heard of since the year commenced, and that did not originate here, the party having contracted it while away on a visit and came home ill, but soon recovered after coming home. We have had no other contagious diseases that I have heard of and the health of the township has been, and is at present, remarkably good—so much so that our Board of Health have not thought it necessary to hold a meeting this year.

C. FISHER,
Secretary.

 NICHOL.
Chairman's Report.

In conformity with the provisions of Section 24 of Health Act, 1884, the following report of the sanitary condition, etc., of the aforesaid municipality of Nichol for the year is hereby submitted :—

The Board have the satisfaction of reporting that the general health of the community in this township during the year now nearly ended has been very good. No epidemic of any kind has been prevalent, only two cases of typhoid fever and ten cases of diphtheria so far as known having occurred, and none proved fatal. The cases of diphtheria were confined entirely to the "House of Industry" for the county, which is located in this municipality. Measures were immediately taken to prevent the spread of the disease which proved successful, so that it has some time ago entirely disappeared.

JOHN R. WISSLER,
Chairman.

 MISSOURI EAST.
Secretary's Report.

We have to notice that much more than the usual amount of sickness has been prevalent amongst us during the year just closed.

About the end of last winter there were several cases of diphtheria, two of which resulted in death, but it did not spread beyond the families in which it was first developed, as our people are very careful to avoid the spread of contagious sickness by refraining from visiting, and by keeping their children out of school when there is any danger.

About Easter we had a number of cases of measles, some of which were brought from a distance, and I believe that all our sick were brought safely through.

In the fall of the year several cases of typhoid fever were amongst us of which at least one was imported, and one was directly traceable to unsanitary surroundings. I am glad to say that the parties attacked have all been restored to health, and our Local Board of Health have taken vigorous and efficient measures to prevent the recurrence of danger from the last mentioned cause.

I have much pleasure in being able to state that our present sanitary condition is quite satisfactory.

CHAS. R. COMMANDER,
Secretary.

 MISSOURI WEST.
Medical Health Officer's Report.

In presenting this my annual report it affords me much pleasure to be able to state that the sanitary condition of this municipality (West Missouri) is very satisfactory indeed. Our municipality is chiefly rural; drainage generally is fair; we have an abundance of pure water, and our people are nearly all well-to-do. To these circumstances we attribute our immunity from a serious epidemic of any disease.

The northern part of the township was visited by an epidemic of measles last spring, but the disease was of a mild type and no deaths occurred. A few cases of diphtheria and typhoid fever and one case of scarlet fever were reported, but with complete isolation and efficient disinfection the diseases were confined to the persons primarily attacked. Only one case of diphtheria proved fatal. The typhoid and scarlet fever cases all recovered.

W. J. WEEKES, M.D.,
Medical Health Officer.

NORWICH NORTH.

Chairman's Report.

The Secretary was instructed to have placards printed to supply physicians to put on the houses where any contagious diseases were reported, which I believe was complied with.

In the latter part of the year I received a letter from a gentleman on Otter Creek, east of the village of Norwich, stating that the proprietor of the woollen mill in Norwich had taken no steps to abate the nuisance of running the dye-stuff into the creek. I called a meeting of the Board, and at the meeting of the Board a resolution was passed instructing the Secretary of the Board of Health to give the proprietor of said woollen mill a notice to abate the nuisance by the middle of September of the present year, and if not abated by the said time to proceed against him according to law on the 17th of said month of September. I received a letter from the said proprietor informing me that he was preparing a tank for filtering dye-stuffs, saying the work would be completed with all rapidity.

S. S. BURTIS,
Chairman.

NOTTAWASAGA.

Secretary's Report.

The sanitary condition of this township is good. No contagious diseases visited us during the year. The only slaughter house in the township is within the police village of Creemore, and our Board has no control over it or over any disease which may occur in said police village.

The Reeve of the township is our Medical Health Officer and he has made no report of any description to the Board during the year, verbal or otherwise. Our Board is composed of four members of the council and the clerk, and I would beg to suggest as an amendment to the Public Health Act, that sub-section 2 of section 12 should be amended by adding after the word ratepayers, "not members of the council."

ANGUS BELL,
Secretary.

ONONDAGA.

Medical Health Officer's Report.

I beg to present my annual report in accordance with the provisions of the Public Health Act, and in doing so it gives me pleasure to be able to state that during the past year the sanitary condition has been good.

No epidemic of contagious or infectious disease has visited us. Malaria—like the poor—we have always with us, and it will continue to be so until the obstructions in the Grand River are removed, thus securing a free outlet not only to the waters of the river, but also to those of its affluents. I would respectfully suggest that the municipal council should send an earnest appeal to the Government to have the dam at Caledonia removed as soon as possible. If this work would be done during cold weather it would be better, as the malaria arising from the moving of the soil would be neutralized.

R. H. DEE, M.D.,
Medical Health Officer.

OPS.

Medical Health Officer's Report.

In accordance with the requirements of the Statute, I beg to report as follows:—

The sanitary condition of the township of Ops during the past year has been excellent, no epidemic or contagious disease, and comparatively little general sickness having shewn itself.

Under these circumstances the duties of your Medical Health Officer have been merely nominal, and my report is necessarily a brief one.

THOMAS W. POOLE, M.D.,
Medical Health Officer.

ORILLIA, ETC.

Secretary's Report.

I have received no report of any case of infectious disease having occurred in our municipality during the past season, and the duties of our Sanitary Inspectors have been very light.

As the Medical Health Officer has made no report, having, as far as I know, no duties to perform, I cannot include it with this, as required by the Act.

As this has been a season in which many localities have suffered severely from sickness, I beg to congratulate you on its absence from our municipality, and hope that the duties of our successors in office may be as light as ours have been.

ALBERT FOWLER,
Secretary.

OXFORD EAST.

Medical Health Officer's Report.

In compliance with the requirements of the law, as Medical Health Officer of your municipality, I submit to you my report.

I congratulate you in maintaining the usefulness of your Board as a means of disseminating a more general diffusion of sanitary knowledge, a matter which I regard as among the most necessary of the present age ; one of the most important reforms of the age is that of sanitation.

Some of our most formidable of acute diseases, such as diphtheria, erysipelas and typhoid fever, have their primary cause in the decomposition and fermentation of sewage—diseases that are preventable and should not exist. Water contaminated with sewage, or the air constantly vitiated from emanations in old privy vaults and elsewhere, are in any event the common cause of a depression of the general health and the diseases above referred to. I have therefore recommended, so far as I have had the opportunity, the sanitary measures of relief.

I have visited several school sections in the municipality for the purpose of observing the system of sewerage in vogue, and for ascertaining the condition of the water.

In all instances the water supply is from wells ; the samples so far tested are positively bad in many instances.

I would therefore advise a thorough cleansing at once of all those wells suspected, and their careful protection afterwards.

I find some of the vaults in an unhealthy state and would urgently recommend the immediate adoption of the dry earth system. This I believe to be our only true remedy. It renders the excreta inert and, therefore, harmless, and is also comparatively inexpensive. I would suggest also that some regulation be adopted to make the plan universal, and specific instruction issued accordingly.

Perhaps it would be well to make the system imperative, as the Board has power to do so.

The factories and dairies and the milk supply should be inspected in their season, and reported to the Provincial Board of Health.

There has been no exceptional or undue sickness during the last year, and the death rate in the municipality has been small.

J. H. THRALL, M.D.,
Medical Health Officer.

OXFORD NORTH.

Medical Health Officer's Report.

This section of the country has been visited by three epidemics since our last annual report, viz., one of measles, one of whooping-cough, and one of diphtheria, while scarlatina and typhoid fever have been endemic among us.

There have been eight cases of typhoid fever, and, with two exceptions, were of a mild type—one death.

There have been eight cases of scarlet fever, all mild and not followed by sequelæ.

I am unable to give even an estimate of the number of cases of measles and whooping-cough, but the number attacked was very great, including nearly every individual child and adult who had not previously had those diseases.

Diphtheria began to be epidemic among us in November of 1886, as will be remembered on referring to our last report, and continued to exist in an epidemic form nearly all winter, and since then the locality has never, for any length of time, been free from endemic cases of the disease, and though many severe cases occurred, yet none were of the malignant type which were reported in various parts of the country. There were forty-five cases in all, six resulting fatally, three being in my own practice—all the result of catching cold after a very mild attack of diphtheria, which was not recognized as diphtheria at all by the parents until too late.

A very noticeable feature of those epidemics was that though there were so many cases, I am unaware of a single case being followed by the usual sequelæ in virulent diphtheria, which result I attribute largely to the spread of accurate knowledge regarding

the nursing and care of the diseased, and the more comfortable homes and sick rooms which are rapidly supplanting the houses of former days, together with the growing habit of employing medical aid even in mild cases.

JNO. McWILLIAM, M.B.,
Medical Health Officer.

OXFORD WEST.

Medical Health Officer's Report.

I have the honour to report that the sanitary condition of the township of West Oxford has been good. There have been a few sporadic cases of malarial and typhoid fevers and diphtheria, but nothing approaching an epidemic in this or other class of diseases which have their origin in preventable causes.

This showing is the more favorable from the fact that after an exceptionally dry summer it is the zymotic or contagious diseases that mostly prevail.

I would recommend to the Board that an effort be made to introduce the dry earth closet into more general use, in order that one of the principal agents for the spread of diseases of the above nature—viz., the contamination of wells from sewage—may be removed.

J. W. BROWN, M.D.,
Medical Health Officer.

PELHAM.

Secretary's Report.

The Board held its first meeting 30th May, 1887, the members being all present.

D. J. Stone reported that the school in section No. 4, Pelham, was closed on account of diphtheria in the neighbourhood.

Dr. Comfort, Medical Health Officer, said that Dr. Birdsall had reported to him a case of diphtheria in the same neighbourhood, in the family of Jos. Fisher.

This was the only meeting held during the year.

Only one of the four doctors residing in this municipality made any return of infectious diseases to the Local Board, and yet two of the members of our Local Board are old practising physicians.

With reference to your circular of 28th Nov., *re* milk supply, I may say there are no milk vendors in this municipality.

JUDSON C. CROW,
Secretary.

PEMROKE.

Chairman's Report.

The Local Board of Health for the township of Pembroke reports as follows for the year 1887:—

We have had four cases of diphtheria in our municipality, one of which terminated fatally.

We have had two cases of typhoid. None fatal.

There have been a few cases of death from typhoid fever in the hospital of parties who have not resided in the municipality.

Upon the whole, our municipality has been remarkably free from contagious or infectious diseases.

A. T. WHITE,
Chairman.

PILKINGTON.

Secretary's Report.

The Local Board of Health for the township of Pilkington, county of Wellington beg leave to inform you that there has been no epidemic disease of any kind in this township during the past year. The Board has had only one meeting during the past year, and as the public health was good no medical health officer was appointed.

ROBERT CROMAR,
Secretary.

PITTSBURG.

Chairman's Report.

The Board of Health of the municipality of the township of Pittsburg, beg leave to report that the sanitary condition of this municipality for the past year has been excellent and now is in a healthy state. The Board have taken every precaution to have cleanliness strictly observed, and have had no difficulty in seeing the requirements of the Public Health Act carried out.

W. HUTTON,
Chairman.

PLANTAGENET SOUTH.

Secretary's Report.

There were only two occasions during the past year in which we had to direct our Medical Health Officer, Dr. Pattee, to inspect premises reported having diphtheria, both of which reports after investigation proved false.

No sickness of a contagious nature as far as known exists in the municipality, and the township is in a very good sanitary condition, which the Local Board of Health will use their powers to maintain.

A. McLEAN,
Secretary.

PORTLAND.

Chairman's Report.

I beg leave to report that no epidemic of contagious or infectious disease has existed during the year, nor has any complaint been preferred to us touching any violation of sanitary regulations. This municipality is believed to be in an excellent sanitary condition.

R. THOMPSON,
Chairman.

 PROTON.
Chairman's Report.

I have the honour to forward the annual report of the Local Board of Health, township of Proton. The members met for organization on the 24th day of February, at the village of Hopeville.

Dr. James McWilliam, Dundalk, medical health officer, the other members, as health inspectors in the several township divisions were present.

The Board have not been called upon to take action in enforcing the Public Health Act, no cases of infectious or contagious disease being reported during the year; the seasons have been unusually dry but healthy, and from the altitude of the township we have not suffered from excessive heat or drouth apparently. Taken altogether, I am thankful to be enabled to report the passing year to be a good one as regards the health of our people.

SAMUEL ROGERS,
Chairman.

 RADCLIFFE.
Secretary's Report.

At the beginning of the year members of a Local Board of Health were appointed by the Municipal Council, also a Medical Health Officer without salary was nominated.

The Local Board have held no meetings.

During the current year there have been no infectious or contagious diseases in the municipality. Indeed, so healthy has been the state of the people that no deaths from any cause have been registered during the year. There are no cheese factories, public dairies or milk vendors in the municipality.

The Medical Health Officer reports that the sanitary condition of the municipality is good.

JOHN E. H. MILLER,
Secretary.

 RALEIGH.
Medical Health Officer's Report.

In presenting my report for the present year I beg leave to compliment the Board on the excellent sanitary condition of the township.

It is my duty to report that during the present year your municipality has been exempt from any widespread outbreak of disease of an epidemic nature. There have been four cases of typhoid fever in the house occupied at present by Mr. David Thorp; these terminated with three recoveries and one death. These cases, I believe, are due to the unsanitary condition of the building in which they live. I would recommend the Board to see that this building is closed or put in a sanitary condition. A few other cases of typhoid have broken out in your township, but the disease was contracted in the town of Chatham. There have been a few mild cases of scarlet fever; no deaths.

There have also been a few cases of diphtheria, but only one death.

A good many cases of a very light form of whooping-cough have occurred.

A great many cases of malaria have existed in your township this present year. This, I think, is due to the bad water supply. I notice particularly a great many cases arise in connection with our large stave mills, due, no doubt, to the stagnant water and decomposing of vegetable matter.

In conclusion, I would call your attention to the following matters :—

See that all cases of an epidemic nature be reported to your Board by the attending physicians, so that the Board may take the proper measures to prevent the spread of the same.

Make it compulsory for school trustees to provide a good water supply ; have the school wells cleaned out, at least once a year.

Have it compulsory for the trustees to have the privies disinfected and kept in a sanitary condition.

Have it compulsory that trustees should admit no child to school that has been suffering from any contagious disease without a physician's certificate.

*I am fully convinced that if your Board are legally entitled to do this—and in doing so you will be doing that which will have these suggestions carried out—it would be a benefit to the inhabitants of your municipality, and would promote the ends we have in view, *the furtherance of public health.*

JOHN CHAS. BELL, M.D.,
Medical Health Officer.

ROCHESTER.

Medical Health Officer's Report.

Since last report but little has occurred of medical interest in your district, as there was only one case of diphtheria and a few cases of typhoid fever. The past and present high state of health is altogether very remarkable.

Personally, I might claim to join in the general doleful cry, " Ah, yes, indeed, trade is very slack."

In closing, I congratulate the Board upon the good sanitary condition of the township.

U. GABOURY, M.D.,
Medical Health Officer.

ROLPH, BUCHANAN AND WYLIE.

Secretary's Report.

I beg to report that there were no contagious diseases in this municipality of Rolph, Buchanan and Wylie for the year 1887. There has been no sickness of any kind worthy of note.

FLORENCE McCARTHY,
Secretary.

ST. JOSEPH.

Secretary's Report.

A meeting of the members of the Board of Health of the municipality of St. Joseph was held at the residence of Dr. Ross, Richard's Landing, on December 29..

Dr. Ross reports a few cases of a very mild type of measles, so mild that he does not think medical treatment necessary. This is the only form of infectious disease we have had during the year. The township is in an excellent sanitary condition.

P. G. BAILEY,
Secretary.

*[By carefully reading over the General Health Acts, it will be found that Local Boards have the powers, and certainly they should be enforced.—ED. REPORTS].

ST. VINCENT.

Chairman's Report.

The same persons constitute the Board as for 1886. There has been no complaint or case to require investigation during the year.

The Board reports the sanitary condition of the township as being generally good, as is also the general health of the people.

JAS. BOWES, JR.,
Chairman.

SANDWICH EAST AND WEST.

Medical Health Officer's Report.

I beg leave to submit my annual report for the year ending 1887. During the past year infectious and contagious diseases have fortunately been very scarce. There is but one case at present to my knowledge of scarlet fever in the township.

A committee appointed by the Board, consisting of myself, the reeve and Sanitary Inspector, inspected and carefully examined the premises known as the Dominion Sugar Refinery, situated in Walkerville. We found that the water for a long distance below the works was rendered unfit for use because of the emptying of the sludge from the works into the river. The manager of the works explained the nuisance in this way: The box drain built to convey the refuse from the factory into running water had become blocked up, and they were consequently obliged to dump the refuse along the shore. I would recommend that the same committee again inspect the works to ascertain whether the nuisance has been removed.

H. R. CASGRAIN, M.D.,
Medical Health Officer.

SARNIA.

Medical Health Officer's Report.

I have the honour herewith to submit the following report for the year 1887. During the early months of the year measles prevailed extensively in the southern parts of the township. The disease was of a somewhat severe type, but there were very few fatal cases. During the summer and autumn months it was feared that the great drouth, and scarcity of water both for animals and for household use, would lead to serious results; but fortunately the general health of the community seemed very good indeed. There were, however, a few cases of typhoid, caused, in all probability, from using water which had been polluted by soakage from adjacent manure heaps and other contaminating sources percolating through the ground to the wells.

In the month of December scarlet fever, which had been prevalent at the village of Point Edward for several weeks, made its appearance on the second concession of the township and extended to three families residing near the Sarnia and Florence gravel road, and subsequently some young friends of one of the families visiting them conveyed the fever to their home in the fifth concession; happily none of the cases have as yet proved fatal.

The attention of the heads of families in which scarlet fever had appeared was drawn by the Sanitary Inspector, Mr. Copland, to the contagious and often dangerous character of the disease, and the request made that they should not mingle with the neighbours at church or public gatherings till the danger of infection should have ceased.

Owing to the great inconvenience to farmers of having to remain at home while marketing, milling and teaming require them to be moving about, it is difficult to have a

strict quarantine and isolation carried out. And the sympathy of neighbours in country districts towards each other when suffering from affliction is so great that they can scarcely refrain from manifesting their kindness and good feeling for the afflicted by visiting and remaining at their houses often unreasonably long. Even contagious disease will not deter a considerable amount of visiting, particularly if the type of the disease be mild; when the epidemic is severe the visiting is much less. Reporting contagious or infectious disease, and placarding houses infected, has not yet been observed to any extent in the township.

The advantage of placarding consists largely in giving timely warning to persons calling at houses so distinguished not to enter if they have any dread of the disease, and desire to avoid conveying it to their own families or to other persons.

Complaints have for several years past been informally made of the offensive smells arising from slaughter houses in the outskirts of the town of Sarnia, and of the fisheries on the banks of the St. Clair, in the Indian reservation. The complaints are both by travellers on the road and by persons residing in the vicinity of the places in question. I have reason to believe that the smells are at times very disgusting. This nuisance, I think, could be largely if not wholly obviated by the use of dry earth scattered regularly on the blood and offal incident to such establishments, in the absence of a supply of water to flush it away. Dry earth, properly applied, would not only prevent the nuisance complained of, but, if gathered up and placed in a heap, would be recognized by gardeners and farmers as an excellent fertilizer, and thereby defray the expense of using it. As a matter affecting the public health this should not be lost sight of, as it must surely be injurious to meat to have it hanging for hours in an atmosphere reeking with putrid emanations from decomposing blood or other decomposing animal matter, before conveying it to the stalls for sale and distribution to the consumers. I would also call the attention of the Board respectfully to the practice of hauling refuse and rubbish of different kinds from the town of Sarnia and unloading it in open spaces or by the wayside, instead of either destroying it by fire or by burying it in some place provided by the health authorities, or by the corporation of the town of Sarnia, for that purpose. I would also here refer to the regulations recently adopted by the Provincial Board of Health for the licensing and registration of shippers and vendors of milk. Those regulations are, in my opinion, in the interest not only of the public but in that of the respectable and honest dealer, who need not fear any inspection or criticism as to the quality of his milk, the condition of his byres, or the health and comfort of his cattle; and as there are no irksome or vexatious conditions imposed upon parties taking licenses, and no fees, or at farthest only nominal fees imposed, the regulations should meet with the acquiescence and approval of dairymen themselves. All of which is respectfully submitted. I have the honor to be, gentlemen, your obedient servant,

A. MACLEAN, M.D.,
Medical Health Officer.

SARGEON.

Medical Health Officer's Report.

In presenting the third annual report of the Medical Health Officer, in compliance with the Public Health Act, I would congratulate you upon the freedom from disease generally throughout the township during the year. The death-rate has, I think, been low and the sanitary condition very satisfactory.

A few months ago a mild epidemic of diphtheria existed in S. S. No. 6, but as I was not asked to make any investigation, I cannot say how it originated, or how far it was due to preventable causes, though probably it had an outside source. In all such cases I would suggest prompt official examination, and the closure of the school if found necessary.

J. W. McARTHUR, M.D.,
Medical Health Officer.

SARAWAK.

Medical Health Officer's Report.

My duty as Medical Health Officer is satisfactorily performed in submitting this report for 1887.

We are in a position to congratulate ourselves on the health of our people, and the general sanitary environments of their homes. No epidemic or endemical disease during the present year. The Health Inspector has been indefatigable in his endeavors to improve the healthy condition of the township, and we have every reason to be thankful that the Board has secured a profitable reward for its labours.

CHAS. E. BARNHART, M.B.,
Medical Health Officer.

SCOTT.

Medical Health Officer's Report.

In looking over the year 1887 with a view to making out my annual report, I may say that, on the whole, the sanitary condition of the township up to the present is fairly satisfactory. There have been about nine or ten cases of typhoid fever this year, and the majority of these cases have been caused by the pollution of drinking water by soakage or drainage from the barnyard into the wells. Many people suppose that where water is filtered through a few inches of ground it is perfectly pure and fit for family use, but in such water are often found the germs of typhoid fever and other diseases. Now, a properly-constructed well should be raised a few feet above the level of the ground with brick and mortar, and well secured at the top to prevent leakage from above. In many cases we find the well situated in the barnyard, and in others, again, although they are not quite so near, they are on lower ground and necessarily are the receptacle for drainage from the barnyard. I would also like to draw your attention to another point. It is a mistake to think that because there is no standing water in the cellar there is no dampness. For while there may really be no standing water there the cellar floor may be sufficiently damp to be the cause of many diseases of throat and lungs. This difficulty might be easily overcome if there was an open drain under every house to purify at least two feet of earth, and also carry off all bad air accumulating there. The minds of the people should first be thoroughly aroused to these dangers, and then we may hope to see the sanitary condition of the township very much improved in these respects.

D. CAMPBELL,
Medical Health Officer.

SENECA.

Medical Health Officer's Report.

As Medical Health Officer for the township of Seneca, I have the honour to report that the general sanitary condition of the municipality is favourable. There has been no epidemic of any kind. A few isolated cases of diphtheria, none fatal, and one case of scarlet fever occurred. There has been no typhoid in the lower or eastern end of the township, and none have been reported from the western side of Seneca. The residents are gradually becoming alive to the benefit of sanitary laws, and as a rule meet readily any suggestions or orders they receive for their own benefit and protection. The great scarcity of water all over the township was not followed by any evil consequences, but indirectly was the means of causing a great number of wells to be bored, giving in this

locality an abundant supply of good pure water, which will tend still further to lessen the cause of disease.

The general health of the township is very good, and as far as I know the death-rate for the year has been very low.

ROBERT H. DAVIS, M.D.,
Medical Health Officer.

SHERBROOKE.

Secretary's Report.

Not as yet having received any report from the Chairman or Medical Health Officer of the Local Board of Health for the township of Sherbrooke, I take it upon myself to furnish you with the annual report as requested.

Diphtheria appears to have been the most prevalent disease in the township during the year and of which there were seven cases, as near as I can find out, resulting in one death. I might say that there is no contagious disease that I know of in the township at present. The reason why I have been so dilatory in sending you this, is on account of my waiting for the report from the Chairman and Medical Health Officer, as neither of them live, in the township. I have written twice to them on the subject with out receiving any answer.

WM. CHALMERS,
Secretary.

SOPHIASBURG.

Secretary's Report.

The Board met at the Township Clerk's office, Demorestville, on Friday, the 2nd day of December, 1887, at the hour of 3 o'clock p.m. Members present: Samuel N. Smith, Esq., Reeve; Dr. J. Cryan, Medical Health Officer, and Messrs. Josiah Benson, Albert J. Brooks, members, and Ira B. Barton, Secretary.

Moved by J. Benson, seconded by A. J. Brooks, That S. N. Smith be appointed Chairman of the Board.—Carried. The Secretary read a communication from the Secretary of the Provincial Board of Health.

Moved by A. J. Brooks, seconded by Josiah Benson, That all members of the Board be and are hereby ordered to take action to have all parties punished who neglect to carry out the provisions of the Public Health Act as therein provided.—Carried.

On motion of Dr. J. Cryan, seconded by J. Benson, the Board adjourned to meet again on the call of the Chairman. Our Medical Health Officer thought it not advisable to make his annual report the present year on account of there being no contagious diseases prevalent, but will in the future make full reports. The Board hope to attend to their duties more faithfully in the future.

IRA B. BARTON,
Secretary.

SOUTHWOLD.

Secretary's Report.

The Local Board of Health of the municipality of the township of Southwold, in the County of Elgin, have the honour to make their third annual report, and in doing so beg to state that said municipality has been highly favoured in the last twelve months, for

there has not been one case of any kind of contagious diseases within the municipality, such as typhoid fever, scarlet fever, diphtheria or smallpox. There have been a few cases of malaria, but they did not amount to much. All deaths reported within the last twelve months were from natural causes, except two cases of suicide. There were three complaints made during the year of existing nuisances to the Board of Health, which were attended to and removed at once. All slaughter houses, cheese factories, dairies, school houses and premises thereto, were inspected and almost in every case they were next to faultless. Each member of the Board acts as health officer. The Board have divided the municipality into districts and each member has his district, to look after. The Board held five meetings during the last year and inspected all slaughter houses, cheese factories and dairies in a body. The sanitary condition of this municipality will compare favourably.

M. CAMPBELL,
Secretary.

STAMFORD.

Medical Health Officer's Report.

I have to say that the past year has been a remarkably healthy one; no prevailing epidemics. Have had reported to me three mild cases of diphtheria, two by Dr. Trimble and one by Dr. McGarry. Have had none in my own practice. Believe the sanitary condition of the municipality to be good, from what I have learned from the Inspector. Anything that has come to my notice has been referred to him for investigation.

JOHN M. DEE, M.D.,
Medical Health Officer.

STEPHEN.

Secretary's Report.

So far as making out a report I have not much grounds for material. The members of the Board are quite regardless of their duties and leave everything with the Secretary. I have no Chairman's report, no Medical Health Officer's report, no report from the Sanitary Inspector, and should I request such reports to be handed in it would not be done. Knowing that no member of the Board or other official than myself has in any way acted in the matter, I will make a report of what has been done by me as Secretary. Some time in the early part of the summer a resident of this locality visited friends near Toronto, remaining some weeks. It appears diphtheria of a very malignant nature was in the family where she was visiting. Her child took the disease and got better. The lady took this child to this township, and the disease was caught from said child and numbers died. I visited the medical men, and the usual preventive measures were used. I ordered the school to be closed. The Chairman of the Board lost one son, and he and his wife were both down with it. I placarded the places and did everything that I could do to prevent its spread. I think there is no cases in this township at present, although in the adjoining township one family were all down; three deaths and more sick. Typhoid fever carried off a few Measles are prevalent around this locality at present. Since writing the above one case of diphtheria has occurred, but the patient recovered. I hear of no more cases. The Board met yesterday, 12th December, but no reports were handed in. I was requested to make this report in accordance with above facts, which was adopted.

C. PROUTS,
Secretary.

STISTED.

Secretary's Report.

I beg to submit to you the annual report of the Stisted Board of Health. The Board met on the 24th November, and reported the township to be in a very satisfactory condition—no contagious disease of any kind—the deaths registered in the township being only one for the year out of a population of 700. That speaks for itself in regard to the health of the municipality.

TOM LAKEMAN,
Secretary.

SULLIVAN.

Secretary's Report.

During the year now closing our municipality has been free from any contagious disease, the general health being exceptionally good, the death-rate being very low. Out of a population of 3,750, only three deaths were reported for registration during the past six months and two of these were persons over 85 years of age. The Board attended to the sanitary condition of school houses and school premises. No Medical Health Officer or Sanitary Inspector was appointed this year.

A. STEPHEN,
Secretary.

SUNNIDALE.

Secretary's Report.

As regards the sanitary state of this division for the present year, we are pleased and feel thankful that there has been no outbreak of any disease of an epidemic character. There has not been any necessity for a meeting of the Local Board, and therefore no need of a report by our Medical Health Officer. The deaths occurring among us were of the ordinary class in a healthy locality, as our position is a purely agricultural one. We have only two villages, and singular to relate we have no tanneries, slaughter houses, factories, or any business of an unhealthy character.

GEORGE BURROWS,
Secretary.

THOROLD.

Medical Health Officer's Report.

The Board of Health of the township of Thorold, after being constituted by the Council of said township, met and organized. I was appointed Medical Health Officer and Inspector, Mr. John Wilson, the Reeve, being the other Inspector.

We had occasion to make several tours of inspection to the various slaughter houses which lie within our jurisdiction. The butchers slaughtering in these houses we found had to get frequent instructions and repeated warnings before they would comply with the arrangements of the Local Board as to cleanliness and other sanitary precautions.

We succeeded, however, in bringing these places to a condition of sanitary perfection but not without an effort, I can assure you, and in one case particularly we were on the verge of having recourse to prosecution under the Act, before we succeeded.

In the case of slaughter houses we have found that it is necessary to maintain a constant surveillance over them, as they are inclined to be negligent and dilatory with their sanitary precautions, and to take advantage of the interim between the Inspectors' visits.

All the butchers keep pigs in an immediate adjacent lot to the slaughter house, allowing the pigs to feed out of a trough into which the blood runs directly from the slaughter house floor.

With this arrangement we have had considerable trouble, and the idea has occurred to me that it may be necessary to have them isolate the pigs and carry the blood and other offal some distance from the slaughter house to where the pigs are fed.

Our Inspectors, besides making the necessary inspections in connection with the slaughter houses, made such other inspections as we deemed necessary, viz., we made tours of inspection to villages where cows and pigs were kept, and where we found ample scope for work, and where we suggested many changes and improvements in a sanitary view.

We also attended to any complaints which were made to us, many of them trivial, others of importance; and in all cases I am pleased to be able to state that we were enabled to properly adjust matters satisfactorily to ourselves and all other parties concerned.

Your Secretary has sent to me numerous blanks of set questions, which I was requested to fill out with answers.

I have not complied. My reason for not doing so was because the questions asked were not in, perhaps more than one in ten, applicable to rural districts, and consequently the result of my answers to those questions would be, as to any advantageous results, almost negative. The questions asked were mainly suitable only to large towns and cities each deriving water supply from some common source, and have, sewer traps, ventilation sewerage, etc. This leads me to ask you the question: Have you in your Board any representatives of rural districts? If not, permit me here to suggest the acquisition to your ranks of some competent co-operatives from rural districts, who would be enabled to assist you very materially in the very laudable objects of your Board, and in making your "science applied" still more general and effectual.

We have in rural districts two principal sources of water supply, or I might perhaps add a third, viz.: 1st, from the rain fall, which is collected from the roofs of the buildings and conveyed by means of conduct pipes to cisterns from which many people derive their sole supply. 2nd. Natural springs, which usually furnish very pure water. 3rd. Wells, of which there are two very distinct kinds, viz., 1st. the old fashioned well dug into the ground from fifteen to thirty or forty feet until a supply of water is found, and which in itself is usually pure, but which is almost universally contaminated by the ingress of surface drainage which carries into these wells the washings from all the excrementitious matters in their vicinity, thereby rendering the water, in the majority of the wells in the rural districts, unfit for use.

Very many wells if examined would, I am satisfied, be found in a very filthy condition, owing to the neglect of the people and their ignorance of the dangers attendant thereon.

A remedy for this should be sought out and applied.

The second division of which I spoke is the artesian well, which precludes the possibility of surface drainage into the well; but the water found in them is, in this part of the country at least, highly impregnated with minerals in solution, and notably sulphur.

This municipality has been remarkably free from both epidemic and endemic diseases, due, I have no doubt, to a certain extent at least to the careful supervision exercised by the Board in matters pertaining to health and sanitary reform.

H. PARK, M.D.,
Medical Health Officer.

TILBURY WEST.

Secretary's Report.

In presenting my annual report it gives me pleasure to be able to state that during the past year the sanitary condition of the township appears to have been good. We have not at present any epidemic of contagious or infectious disease, except a few cases of diphtheria and typhoid fever, the latter being the only infectious disease that showed any tendency to malignancy, or indication of becoming to any extent epidemic; about twenty cases of this disease have been reported during the past year, a few being fatal.

J. B. CHAUVIN,
Secretary.

TORONTO GORE.

Chairman's Report.

In conformity with Sec. 24 of Health Act, 1884, and sections 1 and 3 of Schedule A of the said Act, the undersigned has to report as follows:—

That during the year 1887 the Local Board has not been called upon to take any action, as the health of the township has been exceptionally good; and in no case has any case of contagious disease been brought to the notice of the Board.

I have also to report that no slaughter house or other public nuisance has existed in the township during the present year.

M. DOHERTY,
Chairman.

TUCKERSMITH.

Medical Health Officer's Report.

In presenting to you my annual report as Medical Health Officer for the township of Tuckersmith, I have to express my satisfaction with the hearty manner in which the different members of the Board have co-operated in carrying out the regulations prescribed by law for their guidance.

In the early part of the year it was deemed advisable to comply with the regulation respecting compulsory vaccination, and as Medical Health Officer I attended at the various schools in the township and vaccinated a large number of children. I regard this action as highly commendable, and I believe that at the present nearly all the pupils in attendance at the township schools have undergone vaccination and are consequently possessed of what experience has proved to be the strongest protection against that most dreaded disease—smallpox.

I am glad to report that during the year there has been no epidemic of a serious character within the municipality. One or two fatal cases of diphtheria have been reported, but in each case the disease originated outside the bounds of the municipality; and from the careful attention and strict measures adopted the spread of the disease has been prevented, and in no case brought to my notice has more than one person been attacked in the same household. There have during the latter part of the year been a few cases of typhoid fever, but I have reason to know that the origin of the disease could not be located within the township in the majority of cases. In families where the disease has appeared in at least two instances a member of the family living in another locality has returned home with what proved to be typhoid, and notwithstanding every precaution being taken, other members of the family have been prostrated

with the disease. Fortunately, no fatal cases have been reported, and I believe the progress of the disease has been checked by the timely attention given by the medical attendants and the members of the households to prevent its spread.

I am glad to report that there is an increased desire on the part of the people to appreciate and endeavour to carry out the regulations and rules governing householders in reference to the sanitary condition of their premises.

In the erection of two new school houses within the municipality due care has, I am pleased to report, been taken in providing for the pupils buildings possessing good ventilation, and having in each room even more than the number of cubic feet of air necessary for each pupil. These new school houses supply a want which has for some time been experienced, the former buildings being of such size as to render it necessary to crowd altogether too many pupils into apartments much smaller than were consistent with the laws and regulations governing in such matters.

In closing this report I beg to express the satisfaction I have experienced during the year in the courteous treatment I have received in the discharge of my duties and my pleasure at the increased interest being taken in the promotion of everything calculated to advance the sanitary interests of the township.

R. W. BRUCE SMITH, M.D., C.M.,
Medical Health Officer.

TURNBURY.

Chairman's Report.

It is with pleasure that we have to report that no epidemic or contagious disease of any kind has visited us during the year that is now drawing to a close. No cases of diphtheria have been in the municipality to the knowledge of the board.

There have been two or three cases of typhoid fever in the Wingham Town Plot, arising no doubt from the marshy nature of the ground, one of them proving fatal. As these cases were under proper medical treatment, they were not reported to the board, neither was the Medical Health Officer ever called to visit them.

The only work that the board has been called on to perform has been the removing of the nuisance arising from the hog-pen at the cheese factory in Bluevale. No complaint has been made about it this summer.

JAMES ELLIOTT.
Chairman.

USBORNE.

Medical Health Officer's Report.

I beg leave to submit to you my annual report.

In October diphtheria made its appearance from a neighbouring municipality, and from this case came six others, all of the same family. Four deaths have resulted.

On the first intimation of the outbreak, the chairman of the board and myself visited the place, made an examination of the house and its surroundings, and had the house placarded and isolated. We found the house and all its surroundings well fitted for the development of diphtheretic germs. The well was close to the door and the chiphill. The earth surrounding the well was apparently the receptacle of the soap-suds and dish-water of the house.

We ordered all funerals to be strictly private, and isolation for six weeks after all signs of the disease had left the house, and all clothing and the house had been thoroughly disinfected. Another building has been drawn up near the dwelling, which has been fitted

up for the use of those members of the family who have not been affected or have recovered, while the frame part of the dwelling is used as an hospital.

We recommended that the log portion of the dwelling should be burnt.

We have taken every precaution to keep the disease from spreading to any other household. I would again direct the attention of this board to the condition of our schools and their surroundings. It would be well to direct the attention of school trustees to the provisions of the Health Act.

They are moving in the right direction as the condition of the schools testify, but we wish they would move a little faster. The yards should be well drained and the disgusting privy pits should be supplanted by the dry earth closet or some such system. The supply of drinking water should be kept pure and in abundance. School wells should be pumped out at least after spring freshets and after holidays.

The heating and ventilation of schools and public buildings is a matter of very great importance, especially so to the health of school children, and is a proper subject for the consideration of this board. In closing this report I would express the hope that next year we may be more strenuous in our efforts to promote sanitary reforms than we have been in the past.

W. IRVING, M.D.,
Medical Health Officer.

WAINFLEET.

Medical Health Officer's Report.

It is my pleasing duty to report that during the past year, although we have been attacked by a double epidemic, scarlet fever and diphtheria, there has been but one death from the same.

In every instance of contagious disease coming to notice during the past year, prompt measures were taken for its suppression, and your board is to be congratulated upon its success. In the adjoining Township of Moulton, where the board for a time procrastinated, diphtheria spread at a fearful rate and a great many children died, and its progress was not checked until outside aid was called upon. The efficiency of the measures then taken to stop its progress was well evinced by the fact that in less than a week there was not a new case in the Township of Moulton.

The people objected less this year than last to having their residences placarded when it was necessary, and are beginning to appreciate more the efforts of the board, and I think in the future all opposition on their part will be of a very trifling nature. I would suggest that the board appoint a sanitary inspector of the township next year, in May or early in June, and educate the people to have their privies properly disinfected once or twice a year, and especially those of the public schools should be seen to.

See that all cases of an epidemic nature be reported to you at once by the attending physician, so that you may take proper steps to prevent the spread of the same.

During the past year there have been forty-seven cases of scarlet fever, thirty-eight of diphtheria and one case of typho-malaria fever, and no other epidemic or contagious disease under my notice. One death from diphtheria, under care of Dr. Emmit, has occurred in the township.

W. B. HOPKINS, M.D.,
Medical Health Officer.

WALLACE.

Secretary's Report.

In conformity with the directions of the board I have obtained 200 copies each of placards, scarlet fever, diphtheria, small-pox, cholera and whooping cough, for the use of

physicians and the Sanitary Inspector, and had also sent by mail printed forms of section 49 of the Health Act to all medical men known to be practising in the township.

I have not personally known of a single case of any contagious or infectious disease during the year in the Township of Wallace, nor have I been notified of any such.

During the year the Medical Health Officer visited a number of the schools and inspected the condition of wells, grounds, buildings and water-closets, and ordered such changes as were deemed necessary.

The sanitary condition of the township will compare favourably with that of any municipality of the Province of Ontario.

R. G. ROBERTS,
Secretary.

WALSINGHAM.

Secretary's Report.

I beg to say that the Local Board of Health for the Township of Walsingham met on the 3rd of November, the first and only time during the current year.

Our council has not appointed a Medical Health Officer. We have a Sanitary Inspectors who looks after the state of premises in the Village of Port Rowan.

JOHN PHELAN,
Secretary.

WATERLOO.

Secretary's Report.

The first meeting of the board was held on Monday, January 31st, in accordance with the statute. All the members attended and subscribed to the declaration of office. It was then ordered to have the report for the year 1886 published with the report of the proceedings and by-laws of the Municipal Council, which was done, thus ensuring a more general distribution of the same.

A complaint was lodged by Mr. Peter Sherk in reference to the deposit of manure and refuse from the distillery and cattle byres of J. E. Seagram, of Waterloo, and also dye refuse and washings from the Waterloo Woollen Mills, into the creek leading from Waterloo to Bridgeport. On instructions from the board the proper parties were duly notified to have the nuisance abated.

Complaint was also made to the board of a grievous nuisance caused by the slaughter house of Joseph Blaschke & Sons, of Blair, and also as to that of Otto Gastmier, of Bridgeport. Both of these parties were at once notified by the secretary, and acted on the notice immediately, and had their premises properly cleaned up, thus fortunately saving the adoption of severe measures.

Early in the season there was an outbreak of typhoid fever of a very malignant type in the family of Mr. Jacob Groh, near Preston. The attending physician, Dr. Mulloy, at once notified the secretary of this board, who placarded the premises, and as the family were in indigent circumstances, and none of them able to do any work, this board, in the public interest, felt it their duty to employ an experienced nurse for them, and also instructed the physician to supply what necessaries were required and present his account for the same to this board. This was done and we are pleased to report that only one member of the family died, and we believe that by the care and preventive measures adopted by the nurse and physician the disease was confined to the one family. The cost was considerable, but the money was well spent.

Seven other cases of typhoid fever and two cases of diphtheria occurred in the municipality of which we had cognizance during the year, but they were of a milder form, and fortunately no deaths occurred, and by the adoption of timely preventative measures, the disease was in each instance confined to the cases where it originated.

The general public health of this municipality has been good. There have been no epidemics or visitations of diseases of a contagious character, and the death-rate has been about the average.

GEO. A. TILT,
Secretary.

WATT.

Secretary's Report.

The Local Board of Health of the Township of Watt, in submitting their annual report to the Provincial Board of Health for the year 1887, have much pleasure in stating that the sanitary condition of this township is in a very satisfactory and healthy condition, and that no outbreak of disease has occurred of a contagious character during the present year.

FRED. RICHARDSON,
Secretary.

WAWANOSH EAST.

Medical Health Officer's Report.

In conformity with the provisions of Health Act of 1884, it is my duty to report that the state of the municipality during the past year has been fairly healthy; that no nuisances have been complained of, and that no contagious or other diseases have prevailed to such an extent as to require public interference.

As a result of the hot and dry summer, we have had a general epidemic of dysentery, but of a mild type and very amenable to treatment.

The same remark applies to measles. I think a scrutiny of our registrar's book will show that but few of the deaths in the municipality are caused by those diseases that are generally considered amenable to hygiene or preventive medicine.

All of which is respectfully submitted.

WM. SLOAN, M.D.,
Medical Health Officer.

WHITCHURCH.

I beg respectfully to report that there has not been a meeting of the Board of Health since the annual meeting for organization.

We are pleased to report that, from enquiry and our own personal knowledge, there has not been a sufficient number of cases of persons inflicted with contagious diseases to require the attention of the Board.

Of course there has been some isolated cases of typhoid fever and diphtheria and a few deaths caused by those diseases, but from enquiry we find that the medical men as well as others in attendance have used all necessary precaution to prevent the spreading of the same.

S. L. FREEL, M.D.,
Medical Health Officer.

WILLIAMSBURG.

Secretary's Report.

The duties of the Board during the past year have been absolutely nominal, owing to the excellent sanitary condition of the township and the general good health of the people. No contagious or infectious disease has occurred during the year, notwithstanding that diphtheria has been prevalent in an adjoining township.

G. C. TRACY,
Secretary.

WILLIAMS EAST.

Chairman's Report.

In compliance with the requirements of section 24 of the Public Health Act, 1884, I beg to report that there has been no sanitary work done by the Local Board of Health during the year in this municipality—none being necessary. There has been one case of typhoid fever, which terminated fatally; there has been likewise one case of diphtheritic croup. With these two exceptions there have been no cases of infectious or epidemic disease in the township during the season. The general condition of the public health is therefore very satisfactory.

TREFFORD CAMPBELL,
Chairman.

WILMOT.

Medical Health Officer's Report.

Though threatened with an invasion of diphtheria on two occasions we have happily escaped any serious trouble, a fact which speaks well for the sanitary condition of our township. We should regard ourselves as especially fortunate this summer in escaping, so far as I know, without a single death from the disease when it existed in a severe form in our immediate neighbourhood.

The duties of our Inspector have been this year extended to the special inspection of the schoolhouses, yards and privies in each school section. Though this has greatly added to his labours, it is work well applied. The school premises in each school section should approach sanitary perfection as near as possible. I cannot lay too much stress upon the fact that a dirty, stinking school yard and privy may not only be a centre from which infectious diseases are carried to the homes of pupils, but by continually breathing the foul air their constitutions may be undermined.

Hitherto the Act providing for the report of infectious diseases has not been enforced. I might suggest that printed slips be supplied the medical men upon which to make such reports, so that when an infectious case arises no time may be lost in taking steps to isolate it and thus prevent the spread of the disease in the neighbourhood or in the school.

Altogether I think your Board may be congratulated for its work this year. I hope we shall all hold ourselves ready to deal with epidemics of preventible disease, and not forget to eradicate their causes—all unsanitary conditions in our municipality.

JOHN MARTY, M.D.,
Medical Health Officer.

WOODHOUSE.

Medical Health Officer's Report.

During the current year one family in this municipality was afflicted with diphtheria. The disease was contracted by visiting a family in an adjoining municipality in which a child died of diphtheria, the case having been pronounced ordinary sore throat. Two of the children had died before I was notified. On visiting the house I found the mother and two of the three remaining children down with the disease. One of the latter afterwards died, making three deaths altogether. The water in the well seemed good, and no unsanitary conditions were visible, the disease having been communicated as above stated. By the use of disinfectants and isolation there was no farther spread of the disease. These cases occurred in the month of August. During the following months several cases of malarial and two or three cases of typhoid fever have occurred, with no deaths. The disease was owing to the long, dry season and the consequent scarcity and impurity of the well water, and not because of any unsanitary conditions connected with the premises concerned. With the above exceptions the general health of the municipality has been good.

JOHN McLEAN, M.D.,
Medical Health Officer.

WOOLWICH.

Medical Health Officer's Report.

We have great pleasure in reporting that the township continues to improve as regards sanitary conditions. A good many pig-styes, both in the country and villages have been moved or rebuilt, one in particular near the centre of one village, which was of stone and worth more than one hundred dollars, has been voluntarily removed to the required seventy feet and rebuilt of stone and brick.

The Board of Health have met three times during the year, all members being present at each meeting, viz., St. Jacobs on January 31st, at Conestogo on May 27th, and at St. Jacobs on October 17th.

We would also report the health of the township as extremely satisfactory at least to most people, as all the physicians report less sickness than ever before in any one year.

We have had no real diphtheria at all, no epidemic of any kind, and only eleven cases of typhoid fever, three of which were slight and three died. These were nearly all at one house, and the Board of Health sent the Chairman and Medical Health Officer to try and discover the cause.

The result of their investigation was that they believe the fever to have been brought to the house, as the well, which at first was thought to be to blame, was found all right and had been used for twenty years, during which time no fever had been in the house until now.

The Health Officer would report that he was directed by the Board of Health to issue the usual annual orders to clean up, and also to visit the villages of Floradale, St. Jacobs, Heidelberg, Winterbourne, West Montrose and Conestogo, which duties were performed; also, all the cheese factories, slaughter houses, etc., were visited and found in good shape except one slaughter house, and that was during the very dry, hot weather, and it was straightened up.

There was no vaccination this year.

W. J. PASMORE, M.D.,
Medical Health Officer and Sanitary Inspector.

YARMOUTH.*Secretary's Report.*

The Board met four times during the year. They inspected all slaughter houses, etc., and found them in good condition.

No complaints were received concerning the sanitary condition of the township, which we believe is first-class.

K. W. MCKAY,
Secretary.

ZONE.

Medical Health Officer's Report.

In making out my annual report for the township, I beg to state that there has been very little sickness of an epidemic character, there being only one case of typhoid fever and four or five cases of diphtheria of a mild type. I immediately placarded the house and ordered them to use disinfectants.

R. D. SWISHER, M.D.,
Medical Health Officer.

ZORRA EAST.

Chairman's Report.

The Board appointed two Sanitary Inspectors and authorized them to inspect all school houses, outbuildings and wells connected with each. All the cheese factories, slaughter houses, etc., were found in a sanitary condition. After serving notices to abate nuisances, the outbuildings of two school houses were put in sanitary order.

The Medical Health Officer states in his report, which is brief, that he had nothing to do or never was called on, and that therefore he had nothing to report, but requested that steps should be taken to make dry earth closets compulsory by by-law.

LEVI WILDFANG,
Chairman.

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SEVENTH ANNUAL REPORT
OF THE
PROVINCIAL BOARD OF HEALTH.
OF ONTARIO.
BEING FOR THE YEAR
1888.

PRINTED BY ORDER OF THE LEGISLATIVE ASSEMBLY.



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SEVENTH ANNUAL REPORT

OF THE

PROVINCIAL BOARD OF HEALTH

TO SIR ALEXANDER CAMPBELL, K.C.M.G.,
Lieutenant-Governor of the Province of Ontario.

May it Please Your Honour :

In presenting for your consideration the seventh annual report of the Provincial Board of Health, I shall, as has been customary in the reports of my predecessors, make a few remarks regarding the progress of sanitary reform, the Board's present position, and its prospective work.

The work of the past year has been very gratifying, abundant evidence being repeatedly furnished of the beneficial results flowing from extensive diffusion of sanitary information by means of pamphlets, sanitary conventions, and such other means as, to this Board have, from time to time, seemed best suited to accomplish the end in view, viz., the education of the people in regard to the best means of preventing or limiting the spread of epidemic contagious disease.

Under the authority of the excellent sanitary legislation which our Government and the Legislature have seen fit, in their wisdom, to adopt the work of the organization of Local Health authorities goes bravely on, there being at present no less than 520 Local Boards of Health and some 350 Medical Health Officers throughout the Province, all more or less actively engaged in performing their duties by perfecting their local sanitary arrangements for the prevention of disease among the people of their several localities.

In numerous instances, during the past few years, many of these local organizations have been suddenly called upon to cope with serious outbreaks of disease, and the prompt, systematic and energetic manner in which they have undertaken the task assigned them has invariably resulted in rapidly stamping out such epidemic outbreaks. In their efforts to carry on the good work, in which they are engaged, many of these Health Officers are frequently meeting with difficulties in determining the causes of outbreaks of disease, whether from bad water, foul air, impure foods, etc., and, in consequence of these difficulties, appeals are frequently made to the Provincial Board of Health for assistance in removing them. In order to meet this urgent want, in some measure, and to assist and encourage Health Officers, who are faithfully, and, generally without compensation, endeavoring to discharge their duties in their respective localities, it is desirable that this Board should be furnished with the means wherewith to carry on practical experimental work in Bacteriology, and in testing the purity of specimens of water, air, food, etc., which are from time to time sent by Local Health Officers. In this way the usefulness of this Board would be very much increased by, in many instances, furnishing the necessary information to assist in limiting the spread of outbreaks of disease. This desirable end could be obtained here by a comparatively small outlay for the necessary apparatus and by making such arrangements as would enable the executive officer of this Board to devote his entire time to sanitary work. Many valuable lives would be, no doubt, saved and much unnecessary suffering and disease would doubtless be avoided by such a course of

action. From the information obtained by experimental work of this kind, many outbreaks of contagious diseases among valuable animals might also be avoided, or cut short and speedily stamped out.

It is gratifying to note the extent to which the inspection of milk is being more or less thoroughly carried out in many places. Milk is so very susceptible of contamination, and from such a variety of sources that the importance of using every effort to ensure the purity of this most important article of food, is very great.

The increasing interest that is being manifested in the great question of the disposal of the sewage of our cities and towns is strongly indicative of the progress which is being made in the direction of sanitary reform. Several of our towns have constructed systems of sewerage and others have the matter under consideration. The Town of Brockville has been the first to construct what is known as the *separate* system, that by which the sewage, and the storm water are carried by separate pipes and the example of Brockville will doubtless, as it deserves, be followed by other towns in the near future. The Government has established a system of sewerage at the Asylum for the Insane, at London, known as the *intermittent downward filtration* plan, which will thoroughly test the system in a practical manner in our Province and if successful, as it can scarcely fail to be, will give an impetus to the construction of sewerage works and the proper disposal of the sewage of our cities and towns, which is in many instances most urgently called for.

Much interest has, of late, also been manifested in the vital question of an abundant supply of pure water to the people in our cities, towns and villages, and it cannot receive more attention than it deserves. It is highly necessary, in the interest of public health, to substitute a supply, for that now so generally derived from wells which are so frequently rendered impure by surface contaminations from the filth by which the ground in their immediate vicinity becomes saturated when proper precautions for its removal are not observed. A number of our towns have recently established excellent systems of waterworks, and others have plans for their establishment now under consideration.

The subject of compulsory notification of the existence of contagious diseases and also that of isolation hospitals, was so very fully and ably discussed by our secretary in the sixth annual report of this Board, that little more need be said regarding it, but the importance of the subject and the desirability of having isolation hospitals established as rapidly and as extensively as possible throughout the various municipalities of the Province will be my excuse for reiterating to some extent what has already been said. Upon the occurrence of a case of contagious disease in a municipality where the system of notification is promptly and fully carried out, the fact immediately becomes known to the authorities. The importance of promptly isolating first cases as a means of preventing the spread of the disease cannot be over-estimated. In no other way can first cases be so completely isolated and the spread of infectious diseases be so effectually prevented as by the immediate removal of such cases to properly constructed isolation hospitals. Not only is the separation of the sick from the healthy rendered complete by this method, but the sick are afforded a better chance of recovery than they can possibly have in the houses of most poor people, the hospital affording better ventilation and other hygienic surroundings, in addition to other advantages, than the houses already referred to. Moreover, instead of the healthy members of the family being shut up in their own premises in close proximity with those that are sick, and a condition of non-intercourse with the public enforced for a long period, as would be the case were the hospital not to be resorted to, they may be permitted after a comparatively short time to mingle with their neighbors and resume their occupations for the purpose of earning the means of support for themselves and those that are ill. Municipalities will, in such cases, be in a great measure relieved from the necessity which often exists, of contributing directly to the support of such families during the continuance of the illness, the sick will be placed in a condition favorable to recovery, and the healthy will be freed from liability to contract the disease. By the removal of cases of contagious diseases to isolation hospitals and their treatment therein, the process of stamping out the disease will be rapid and complete.

FRANCIS RAE,
Chairman.

REPORT OF THE SECRETARY.

To the Chairman and Members of the Provincial Board of Health :

GENTLEMEN,—It is with satisfaction that I have the honour to recall for your consideration the work undertaken by the Board during the past year, and to congratulate you in being able to contemplate with satisfaction the present position of the Province in the matter of public health; for, notwithstanding the fact that infectious diseases have appeared in a very considerable number of instances, they have not except in one or two localities, gained more than a temporary foothold. That this result is wholly or mainly due to the direct work of your Board it would not be correct to state, but that the advances in public health work, which have become manifest throughout the Province, are in large measure due to the compact organization which has been created by legislation, persistently recommended by you and passed by the Legislature, can fairly be affirmed without danger of contradiction. What the character of the subjects is, which have been discussed by you during the past year, will be fully set forth in the various reports following this *resumé* of work; while the varied nature of the work instituted and completed by the numerous Local Boards throughout the Province, is exhibited in the Appendices attached to the report proper.

Another subject which I would refer to with unmingled satisfaction as an evidence of the growing interest and importance of the work, which your Board, as regards the governmental branch, may be said to be the exponent of, is the Association of Executive Health Officers of Ontario, and the work performed by it during the year at its two semi-annual meetings, held in Toronto and Lindsay. Instituted in 1886, this organization has gradually increased in numbers and in the practical character of the subjects discussed by it. It is not too much to say that the grasp shown in the discussions, both of the difficulties to be overcome in executive health work and of the measures by which they are to be surmounted, is most complimentary to the professional standing of the Medical Executive Officers, and the *esprit* and enthusiasm with which they have undertaken the arduous and often disagreeable tasks which are associated with the duties of a health officer. There are, as far as I know, no members of the community who are engaged in a work more benevolent in its character, so arduous in its nature and less likely to be of financial benefit to those engaged. Distinct from the idea of *curative* Medicine as a mere profession or business, it takes on the intensive character of a duty to humanity, and places workers in this field in touch with those broad principles which are the guide and aim of the philanthropist and true statesman. Of such it may truly be said :

“*Virtus, repulsæ nescia sordidæ,
Intaminatis fulget honoribus.*”

The cordial coöperation which for several years past has existed between the executive officer of your Board and those of sister Provinces and neighbouring States, in all public health matters having a more than provincial bearing, still continues. In May last, delegated by you, your secretary attended the Conference of State Boards held in Cincinnati, and took part in the deliberations of that body. Quarantine matters received a large amount of attention, and it was with pleasure that your officer was able to state that the Dominion Government had acceded in large measure to the requests of the Boards of Quebec and Ontario that the St. Lawrence quarantine be fully equipped for the responsible work placed upon it. From the report thereon by Dr. C. W. Covernton, found on a later page, it will be seen that the indefatigable chief of this service, Dr.

Fred. Montizambert, has had ample opportunity given him for carrying on an extended and thorough inspection service during the past year. Through the efforts of your secretary, Dr. C. N. Hewitt, President of the American Public Health Association and Secretary of the State Board of Minnesota, was induced to be present at the summer session of the Executive Health Officers' Association, and to visit and inspect our St. Lawrence quarantine. When it is stated, as was done by him at the Milwaukee meeting of the American Public Health Association, that it compares favorably with all that has been said of the New Orleans quarantine station, we may rest assured that we have at the gateway of Ontario a barrier which may be said to protect us almost completely against the introduction from foreign countries of infectious disease.

Your secretary further took part in this Conference by discussing in a brief paper the subject of Isolation Hospitals, referred to at some length in the report for 1887. Those officers from States most advanced in public health measures strongly supported both the necessity for and practicability of such hospitals, both for urban and rural districts. The outbreaks of smallpox, which have appeared at different times and localities in New York State, further indicate the necessity for close and constant relationships between the officers of neighbouring States and Provinces. As will appear in the report on smallpox in Buffalo, the courteous treatment of your secretary by the Health Officer of Buffalo made it possible for him to maintain in the Medical Inspector, Dr. Lehmann, appointed by the Board, a close observation, of the first importance to the safety of this Province, of the progress of the epidemic in that place. While it would be too much to say that had the Inspector been retained longer in Buffalo, the introduction of the disease in December into Southwold Township, which has had such lamentable results, would have been prevented, yet it is satisfactory to be able to state that during the period, the worst in the history of the epidemic, in which Dr. Lehmann was stationed in Buffalo, no single instance occurred of the introduction of the disease into Ontario.

The reciprocal notification of outbreaks by your Board and that of the Province of Quebec has served to maintain a happy understanding between the two, further cemented by the presence of the Quebec chairman and secretary, Drs. Lachapelle and Pelletier, at the Lindsay meeting of Executive Health Officers.

I. OUTBREAKS OF CONTAGIOUS DISEASES.

Smallpox.—Referring in a more detailed manner to the special matters which the Board has had to deal with during the year, that of outbreaks of contagious diseases deserves our first attention. In Philadelphia and New York cases of smallpox had appeared early in the year, their number in the first-named city having, by April, increased to the degree that the disease might be called epidemic. Prompt notification by Dr. Benjamin Lee, Secretary of the State Board, was given week by week, and evidence went to show that the city authorities were earnest in their endeavors to stamp out the disease. The separation of New York city from the general control exercised by the State Board of Health, made it impossible for this Board to obtain accurate information regarding the actual state of affairs, except in so far as the city death returns gave the number of weekly victims of this disease. Cases from this State were introduced both into the Province of Quebec and this Province. The cases in Ontario occurred in the County of Dundas, in the township of Winchester, and were introduced by a horse dealer who had been exposed while in New York. The cases fortunately were early diagnosed, and the disease was limited to the family in which it first broke out. Owing to the strict supervision exercised at the St. Lawrence quarantine, the usual cases imported, introduced in the persons of immigrants, were absent this year; and the next source of danger was from Buffalo, where the disease had been introduced in July in the person of a Polish immigrant, who had brought clothing through the New York quarantine in an infected condition. The details in connection with this outbreak will be best gathered from the following report on the subject presented to the Board:

OCTOBER 10th, 1888.

To the Chairman and Members of the Provincial Board of Health :

GENTLEMEN,—During the past six months newspapers have reported numerous cases of smallpox in Philadelphia and New York, several outbreaks in Toronto, and since July a very considerable number of cases in Buffalo. According to newspaper reports cases occurred in Toronto about the 12th of July, on Yorkville Avenue. Information obtained from Dr. Edward Clark, Medical Health Officer, Buffalo, on July 26th states that up to that date nine cases and one death had occurred, eight of them being amongst the Polish people of East Buffalo. The letter further stated that 16,000 people had been vaccinated in that district alone, and no new cases had been reported since July 17th, and Dr. Clark said, "I am beginning to think that we have succeeded in stamping it out." On August 2nd Dr. Clark reported to the secretary of the State Board of New York that up to that date there had been fourteen cases and two deaths. In this letter Dr. Clark stated that two cases of the first set of four had been in attendance at a school of 2,000 scholars. The other cases of this first outbreak occurred in the families amongst the relations of these first families. During the succeeding month of August no more cases, or almost none, were reported; but owing to the fact that the class of people amongst whom the outbreak occurred were foreigners, crowded together (as many as 75 being in one tenement), not accustomed to having medical attendance, and being afraid of being quarantined and kept from work, other cases occurred and were secreted. This started the outbreak afresh, and up to the date of my visit, on the 27th of September, to Buffalo, just 60 cases in all had occurred. On three streets outside the Polish district cases have occurred. These are Seneca Street, Niagara Street and Main Street. Regarding these cases, it may be said that they have arisen from people going about in public, or living in houses where secreted cases have occurred. With renewed vigilance on the part of the health officers in searching out secreted cases, it may fairly be hoped that few new cases will occur from that source. The daily papers up to date report nine more cases, but they have been mostly in the Polish centre. One physician was, however, reported dangerously ill with the disease at the time of my visit, and the wife of another is, by to-day's paper, reported to be sick with varioloid, and to have been removed to the hospital.

Returning to Toronto cases, your committee would recall to your recollection that on September 23rd, every city newspaper had a half column or more of reports announcing to your committee and to the world for the first time that smallpox had again broken out in Toronto. From these I find that on September 14th, the disease appeared in a house on Agnes Street, and on the 18th in a house on Richmond Street. There is a considerable similarity in the history of these two recent outbreaks in different cities. First cases occurred in both cities at dates closely approximating. We know that the source of the Buffalo case was the infected clothing of an immigrant who had been allowed to pass through New York quarantine unfumigated, thereafter being hung up in the tenement house in Buffalo that he came to. The source of the first cases in Toronto is unknown to the Board.

Both cities presumably during August had stamped out the disease. Both cities have had industrial exhibitions, and the public in both cases discovered just after these fairs have closed, that smallpox has been abroad.

The sources of the second outbreak in Buffalo have been located in secreted Polish cases. The sources of the two outbreaks in Toronto in different parts of the city are, as far as your committee can gather, undiscovered. We have seen newspaper statements that a woman, who was a cook, and came from Buffalo on account of the prevalence of the smallpox there, had apartments in the Richmond Street boarding-house; that she is at present engaged in a Toronto kitchen, and that for obvious reasons it is not desirable to tell the public which house this particular one is. We have later information purporting to show that this Buffalo story is a myth. At any rate the woman cannot be found.

In consequence of the Buffalo outbreak your committee communicated with the State Board of Health of New York, and asked for information regarding the epidemic, and was informed that smallpox was not epidemic in any part of the State, Buffalo having a charter of its own, and being independent of the health laws of the State. On July 17th all Local Boards along the Niagara border were notified to appoint Medical Health Officers and enforce the laws relating to vaccination. So prompt had been these precautions that no case has occurred on the Canadian side along the whole line. That the disease had got a start which made it probable that cases might occur throughout the winter in the Buffalo district and possibly in Canada, there could be little doubt, as a case had occurred at Black Rock, another at Tonawanda, and another near the Cattaraugus Indian reserve. Your committee had to consider whether the emergency called for further action on the part of the Board than to urge on every Local Board systematic and general vaccination. The danger was in the lack of general vaccination and the possible inefficiency of the measures taken at Buffalo to protect herself and the general public.

But what is Buffalo doing?

1. There is a Medical Health Officer.
2. There is a staff of ten physicians regularly appointed, each of whom has charge in one of ten districts into which the city is divided.
3. There is a corps of eight sanitary police constantly employed, and emergency police sworn in as required.
4. Wide and general vaccination has already been carried on in the Polish District, and 3,000 to 4,000 persons are at present being vaccinated daily.
5. There is a smallpox hospital with a young physician constantly in charge, who from time to time is advised by the Medical Health Officer, who visits the hospital occasionally.
6. While the law in Buffalo requires that the physician in attendance is to give a certificate before a patient can be taken from his home and removed to the hospital, yet, inasmuch as the families in such cases are kept a much longer time quarantined in their own houses, in almost every instance first cases are being removed to the hospital, and the family quarantined for ten or twelve days, and the house thereafter disinfected.
7. The district physicians are making a more or less systematic inspection of their districts in search of secreted cases.

Can more be done by Buffalo in either her own or the public interest? No; if what is being done is being done thoroughly. With regard to this your secretary has become acquainted with the officers and their ways of doing work, and can only say they appear to be laboring earnestly and intelligently to stamp out the disease—quite as much so as any of our own Boards. Results alone can prove the character of the work done in any case.

Your committee has had next to consider whether the work being done, both in Buffalo and by our own Local Boards, should be supplemented by a train inspection service under its direction. With regard to this, your committee would say there would be a number of points to watch. There are the Suspension and Cantilever bridges at Niagara Falls—the great proportion of the passengers over which are going to and from the east, and, if they go to Buffalo at all, would pass through by train. The carriage and foot-path bridge at Clifton, where excursionists frequently are crossing and recrossing: the International bridge at Black Rock (Buffalo): the ferry at Fort Erie, and other boats, schooners, etc., going up Lake Erie and touching at Canadian ports.

This line is an extended and divided one, and would need some six officers to do the work thoroughly. This would mean a vaccination or requiring a certificate of vaccination of all passengers crossing over, and a fumigation of all baggage, since through passengers may have stayed in Buffalo. It would mean hours of detention for trains and passengers, and would only serve to aid railroads running along the southern side of Lake Erie, to the detriment of Canadian commerce, as travellers would, if possible, avoid passing through Canada. If the necessity owing to carelessness in Buffalo was evident, your committee would have no right to discuss commercial considerations; but inasmuch as this has not been proven, a service not urgently necessary would be performed perfunctorily in a short time, and evil would result from the false sense of security created by the pretended inspection.

In conclusion, your committee would say that every end would, in its opinion, be gained should the Board have an officer of tried experience located in Buffalo, whose special duty it would be to keep a register of every case there occurring, and of every house, and keep this Board informed of any instance in which the quarantine became relaxed, the disinfection imperfectly performed or neglected, and whether any baggage or clothing was removed while in an infected state from any house. In this way alone, it is believed, can effective work be done, while it would be a spur to the Buffalo authorities and a source of accurate information for ourselves.

(Signed) C. W. COVERNTON,
FRANCIS RAE,
PETER H. BRYCE,
Committee on Epidemics.

The action recommended in the preceding report was approved of by your Board and endorsed by the Minister in charge of the Department, and Dr. W. Lehmann proceeded to Buffalo on the 12th of October, and carried on the work of inspection in a manner most satisfactory to your secretary. The following report indicates the state of affairs during the succeeding month:—

TORONTO, November 7th, 1888.

To the Chairman and Members of the Board:

GENTLEMEN.—According to instructions received at the last meeting, your secretary proceeded to secure the services of a medical inspector of the Board to proceed to the Buffalo district. After a short delay I secured the services of Dr. W. Lehmann, who left for Buffalo on the 12th October. The Grand Trunk Railway kindly supplied me with passes for the Board's officer. His report is herewith presented in full. The Lambton Mills outbreak was successfully limited to the first house through the energy of Dr. J. Cotton, the Medical Health Officer of Etobicoke Township. The Toronto outbreaks, which at time of last meeting had established seven centres, have through thorough measures been limited to these, and all the cases are convalescent, and no new cases have occurred for over a fortnight.

Similarly, the outbreak in Stouffville was promptly stamped out by the energy of Dr. Freely, the Medical Health Officer of the Local Board.

In North Gwillimbury the outbreak has been more serious, owing to the fact that a number of persons had been exposed in the house where the first cases were. The clerk informed this Board of the fact, and during the absence of the secretary Drs. Cassidy and Covernton, directed that the municipal council at once have a Board organized and a Medical Health Officer appointed, which was promptly done. Two days after I drove through the infected district, reaching it from the south. By good fortune, I met the Local Board of East Gwillimbury in session at Sharon, and obtained all information within its possession with regard to the outbreak, and requested them to appoint a Medical Health Officer, Dr. Armstrong of Mount Albert, which was done. A member of this Board proceeded with me till I met the secretary, Mr. Sennett, of the North Gwillimbury Board, with whom I proceeded to Sutton, where a long conference was held with the Reeves of North Gwillimbury and Georgina, and the Medical Health Officer. Compulsory vaccination was decided upon, and a joint meeting of the four townships adjoining was fixed for the next day for combined action in stationing sanitary inspectors, each agreeing to put on two inspectors, and to arrange for a common isolation hospital if required.

On October 22nd, Dr. Noble, of Sutton, reported nine cases of smallpox, located as follows: seven in North Gwillimbury, one in East Gwillimbury, and one in Georgina.

On October 22nd, Mr. Pass of Brownhill, in Township of Georgina, reports two cases of the disease, one of the patients having contracted the disease in North Gwillimbury according to Mr. Pass's letter.

Mr. Sennett, the Clerk of North Gwillimbury, thinks that the disease is traceable to Toronto, but does not give details as to his statement.

Mr. Scott, Reeve of North Gwillimbury, on October 26th, reports that the orders of Dr. Bryce have all been complied with, and states that about forty families have been quarantined, and that two inspectors are going through his township.

On October 27th, Mr. Anderson, Reeve of Georgina, states that inspectors were appointed in all the townships affected, with the exception of the Township of Scott, as agreed upon at a meeting of the reeves; he states that about fifty families are quarantined, and that six men are vaccinating in Townships of Georgina and North Gwillimbury. He locates the cases thus: six cases in one house situated two miles from Keswick; one case in a house one mile from Keswick; one case in a house about five miles from Keswick; one case in Brownhill.

On October 29th, Dr. Bentley reports that there are no new cases.

Dr. Oliver, of Sarnia, on October 26th, reports mild case of smallpox.

Dr. Johnston, of Sarnia, October 29th, reports two new cases of smallpox, and that strict quarantine has been enforced.

Dr. T. A. Freel, Stouffville, on October 13th, reports a case of smallpox, patient quarantined and vaccination general; the patient had been working in Toronto.

Dr. J. M. Cotton, Lambton Mills, on October 2nd, reports a case of smallpox.

P. H. BRYCE,
Secretary.

TORONTO, November 8th, 1888.

To Dr. P. H. Bryce, Secretary Provincial Board of Health:

DEAR SIR.—In reference to my work in and about Buffalo and along the Canadian frontier in connection with the smallpox outbreak, I have to say that I arrived at Niagara Falls on the 12th October, and found the Medical Health Officer, Dr. Oliver, making a house to house vaccination. Next day, October 13th, went to Niagara Falls South or Drummondville, and found Dr. McGary, Medical Health Officer of that place, also going from house to house vaccinating every person who had not been vaccinated in the last seven years and as many others as were willing. I have every reason to believe that the work was most thoroughly carried out at these two places. I learned while here from Dr. McGary, that arrangements were made for vaccinating the Township of Stamford, which includes the territory about the Falls outside the town. I have since received information from a different source, that owing to some misunderstanding between the Medical Health Officer and the Council the work in Stamford was dropped. I spent some time with Dr. Talbot, the Medical Health Officer on the American side, and found that although he was vaccinating more or less almost every day there was no systematic thorough work done. Arrived at Buffalo on October 14th, and proceeded at once to obtain all the knowledge possible as to the extent and location of the smallpox, and the methods taken to stamp it out. Dr. Clark, the Medical Health Officer, was very kind and genial, and in a very short time I found myself very well acquainted with him and a number of his assistants. The work consisted for the most part of vaccinating, searching for new concealed cases and quarantining, also fumigating. I found vaccination going on very extensively. Free vaccination stations were opened in different places, and house to house vaccination in the Polish district where the large majority of the cases occurred. There is in the Polish district a population of 35,000 Poles huddled together in tenement houses and in a condition favourable to the spread of contagious diseases. Up to this time, over 50,000 people had been vaccinated free.

Whenever a new case was found it was removed to the pest-house if in a fit condition to be moved, the clothing either burned or disinfected by boiling and bichloride of mercury, the woodwork of the house washed with bichloride, and the house fumigated by burning sulphur. The house was then strictly quarantined for a fortnight, and if any other inhabitant of the house took the disease the treatment was again gone over. Up to this time, there had been eighty-six cases of small-pox in Buffalo.

On October 17th, went to Tonawanda, where I found four cases of smallpox and the regulations pretty lax, vaccination not compulsory, and a good deal of disputing among the doctors as to what their duties were, and confusion arising from there being two villages of Tonawanda, one in each county and only separated by a creek. Sailors were not being vaccinated at all and would be almost sure to carry the disease to the ports they touch at if it spreads to the part of the town frequented by them. I could not find any shipping between Tonawanda and the Canadian ports nearer than Georgian Bay, where there is an extensive lumber trade.

October 18th, went to Fort Erie and saw Dr. Douglas, Medical Health Officer, who assured me that the village was being thoroughly vaccinated. He was not making a house to house vaccination, but I had reason to believe that in a little time he would get the village thoroughly done. The Local Board had also decided to put an inspector on the ferry between Fort Erie and Buffalo.

October 19th, visited township of Bertie, including villages of Victoria, Amigari, Ridgeway and Stevensville. I found a very extensive communication between all the frontier townships, towns and villages, and Buffalo; people from the Canadian side within a radius of twenty or thirty miles from Buffalo go there to do a little trading and shopping and visiting friends, just the same as people from the country and villages near Toronto visit the latter city. Besides I found that there were a very large number of domestics employed in Buffalo, whose homes are on the Canadian side, and just at this time a lot of them were coming home and visiting friends, and friends from the Canadian side were visiting them in Buffalo, etc. Thus there seemed a great danger of these townships becoming infected unless thoroughly vaccinated. The township of Bertie in response to a request from yourself had issued a proclamation, calling on all persons who had not been vaccinated within the last seven years to have it done within the next seven days. I visited

the different doctors at the end of the seven days and found that not a hundred people had been vaccinated in the whole township. I then visited a majority of the members of the Council and Local Board of Health, and urged them to issue a new proclamation making vaccination free and compulsory, to appoint each of the three doctors in the township public vaccinators, have them visit all the schools and allow the parents and other members of the family to be vaccinated at the school house along with the children, thus each of the doctors' offices and each school would be a free vaccination station, and none of the people would have more than a mile or two to go. This plan was decided upon and is now being carried out. The doctors have gone heartily into the work, especially Dr. Brewster, the Medical Health Officer for the township, who calls at all the houses on the road to the different schools, so that Bertie is practically having very nearly a house to house compulsory vaccination. Dr. Brewster informed me the other day that fully one-half of the children under ten years had not been vaccinated before and it was the first time for a great many adults. In as many of the townships as I could find time to visit I tried to have something of the same plan carried out, with I think pretty fair success, although some of the townships move slowly in the matter, and it is too soon yet to tell how much will be done. The townships visited include all with the exception of three from Niagara Falls, up the river and along the lake shore as far as Port Rowan. I spent part of my time in Buffalo investigating the spread of the disease and means adopted to check it, and part in the townships until October 26, I went again to Tonawanda, found no new cases of smallpox.

October 27th, found that two days previously, a gang of fifty Italian labourers had gone from Buffalo to work on the South Norfolk Railroad between Simcoe and Port Rowan. I at once went to Simcoe and drove to the Village of Vittoria, Township of Charlotteville, where the Italians were stationed, and found Dr. McInnis, Medical Health Officer, in response to an order from yourself, getting ready to vaccinate them. By the next day they were all vaccinated and isolated, and I then visited the three townships through which the road passes and urged a general vaccination. The same was done also at Simcoe and Port Dover.

October 31st, visited Walpole township owing to a report of smallpox. Found only a few cases of chickenpox, and on enquiry found that almost none of the children in the neighbourhood were vaccinated. Next day, November 1st, I went to Jarvis, where I found a majority of the Board of Health and urged them to see that a Medical Health Officer was appointed and the township vaccinated.

November 5th, Buffalo. Cases of small-pox have been found in the last few days on Canal and Peacock streets, the very worst slums of the city, and the authorities anticipate a pretty severe outbreak in this quarter. A boat came into port to-day from Chicago with a case of smallpox on board. It was one of the sailors, and caused a suspicion that there may be smallpox in Chicago.

November 6th, visited St. Catharines, Thorold and Port Colborne, as I thought places along the canal were pretty badly exposed just now.

St. Catharines has a few cases of measles, is doing no vaccination and has no Medical Health Officer. They promised to appoint a Medical Health Officer at once and take steps to vaccinate the city.

I have the honour to be,
Your obedient Servant, etc.,

W. LEHMANN.

By resolution of the Board Dr. Lehmann's services were continued for another month, and during this period he was engaged largely in the townships along the border, visiting the various Boards and insisting upon the compulsory Vaccination Act being promptly and thoroughly enforced. The following letter from Dr. N. Brewster, the active and efficient officer of Bertie Township, opposite Black Rock, states some of the dangers apprehended and the methods adopted for counteracting such :—

RIDGEWAY, October 15th, 1888.

MY DEAR DR. BRYCE,—I have been down along the river making enquiry as to persons going to Buffalo, who live on this side and work there. That is all stopped now. I could learn of only one who crosses, and that a young lady. Dr. Knisely, who lives at Victoria, says he believes nearly all have now been vaccinated, who were not three years ago when the Montreal scare occurred. But it is quite impossible to oversee all who cross over from here, as there are seven landings and stations where they can get off. The proclamation will cause many to get vaccinated that would not come out otherwise, but nothing less than a house to house inspection will be thorough.

Yours in haste,

N. BREWSTER.

Of the many dangers attached to this outbreak none were greater than that of the bringing in to work on the Norfolk railway a very considerable number of Italians who had been residing in Buffalo. Information of their arrival was received by telegraph, and within a few hours they were all vaccinated and kept under surveillance till the incubation period was over. It is to be regretted that township Local Boards do not

appreciate at an earlier stage, and to a greater degree, the necessity for general vaccination. A small expenditure for free systematic vaccination would have avoided the lamentable outbreak which, beginning in January, has desolated the Township of Southwold, and made an expenditure of what would have been a hundred or so dollars mount up into the thousands. To say that many townships escaped does not lessen either the culpability of or the cost to those which have suffered. That the sin of omission of this prophylactic measure has been in some degree covered by energetic action of these Boards in Elgin county is, however most creditable, but it cannot minimize the loss to those who have suffered, in person or in friends, through the severe character of the cases which have occurred.

Out of the Buffalo outbreak grew, in all probability, the several other outbreaks which have to be noted: As already referred to in the report of your Secretary, outbreaks occurred in Stouffville Village, Ontario county, North Gwillimbury and Lambton Mills in York county, and in Sarnia during the months of September and October, the first cases in every instance having contracted the disease during their presence in Toronto at the Industrial Exhibition in the middle of September. Strangely enough their exposure was in every instance at a time when no cases were known to exist in the city, and the only inference to be drawn is that persons having recently recovered from the disease, or whose clothing had been exposed to the infection, had come in contact, directly or indirectly, with these several victims of the disease.

It is satisfactory, however, to know that in all these outbreaks the Local Boards, when once at work, acted with such promptness and thoroughness as to rapidly suppress the disease.

Of all these outbreaks, that beginning in North Gwillimbury, thence extending to East Gwillimbury and Georgina Township proved the most serious.

As in the later and still more serious outbreak in Southwold Township in 1889 the extent of the danger was greatly increased from failure to early detect the nature of the disease, in part owing to the mild nature of the first cases. In Gwillimbury the first victim was a farmer, and during the period prior to discovery, various persons sat up with the sick, and threshers boarded and slept in the infected house. These not only took the disease, but also disseminated it. A visit to the district by your Secretary served to strengthen the hands of the three Local Boards immediately interested, and Medical Health Officers and public vaccinators rapidly circumvented the disease. Trains for a short time did not stop at one of the infected centres, while threshers, schools and churches for a time were stopped in their ordinary duties. In connection with this, as in every other rural outbreak, a difficulty of great moment arose. There can seldom be found competent and trustworthy persons who will act as sanitary inspectors and carry out the work of disinfection. It is most desirable that some means be considered by the Board whereby such a staff might be educated, and their services be at the disposal of Local Boards during such emergencies.

In connection with these smallpox outbreaks it is proper to mention that the "Act respecting Vaccination" has been found to be of a satisfactory character, and that in no case has any serious opposition been made to its provisions being enforced. The difficulty resides in the prevailing laxity with regard to its provisions for the regular vaccination of children throughout the year. With a Vaccine Farm under the supervision of the Provincial Board, and in a position to supply at all times reliable vaccine in any quantity, there can be no excuse for Local Boards not insisting upon the Act being put into force. Experience has everywhere taught that if it is left to the family physician or the householder children will not be generally vaccinated. If, however, the rule regarding the admission of children to school only on the production of a certificate of successful vaccination were enforced, the same end would in large measure be attained. It is agreeable to think, however, that in almost every case where first cases have been early diagnosed, the disease has been limited to the family where it first appeared. Nothing better illustrates the efficiency of local organization than the ability shown by Boards to stamp out these.

various outbreaks from the moment that their nature has really been made known. The following is a list of the outbreaks and cases which have occurred during the year, and illustrates the generally mild character of the cases and their skilful medical treatment :—

SMALLPOX IN ONTARIO DURING THE YEAR 1888.

NAME OF PLACE.	Dates of Discovery of the Several Cases.	Total number of cases.	Deaths.
Toronto City	April 10; June 27, 30; July 2 (2 cases); September 9, 18, 23, 26; October 1, 4, 6, 7, 11, 12, 14.....	16	1
Stouffville Village	October 2	1	
Lambton Mills (Etobicoke Tp.).....	October 2	1	
Gwillimbury N., Township (York Co.).	October 10, 12 (3 cases), 13 (2 cases), 19, 22 (3 cases); November 1 and 3 (3 cases)	13	1
Gwillimbury E., Township (York Co.).	October 13	1	
Georgina, Township (York Co.).....	October 13 (2 others had disease subsequently).....	3	
Sarnia Town (Lambton Co.).....	October 3, 17, 24, 30 (2 cases); November 8 (5 cases), 12 (2 cases).....	12	
Moore, Township (Lambton Co.)	November 8, November (date not given), November 17.....	3	1
Chesterville, Winchester Township, (Dundas Co.)	Early in the spring of the year (April 10) the disease broke out in a family of four members	4	
	Total	54	3

2. Diphtheria.—Since the study of diphtheria presented to the Board in the report of its secretary contained in the annual volume for 1886 there have been comparatively few new features of the disease which have presented themselves. In that report the history of the disease, both from a medical and statistical point of view, was presented, and a large amount of statistical and exact information will there be found collated. A remark therein quoted from Hirsch's hand-book on the geographical distribution and character of the disease may be recalled with benefit. He says :—"The history shows us also a peculiarity in the comportment of diphtheria as an epidemic which distinguishes no other epidemic disease in so decided a manner. The several cycles have extended over periods of various lengths, many of them only a few years and others lasting several decades." Again he says.—"That certainly, as regards our own time, we have to deal with a general outbreak of the disease."

These two statements are fully borne out by the correspondence which has from time to time been brought before your notice at the quarterly meetings of the Board, and by the reports of Local Boards, as found in the Appendices. Further, it may be mentioned that while certain localities have especially suffered, no portion of the Province has been free from its ravages. This was also true of the previous year, 1887, as shown in the Registrar-General's report just published. The deaths in all the counties showed for 1887 an average of .6 per 1,000 of the population and 1.1 per 1,000 in the eleven cities of the Province. The latter increase is remarkable, as the returns for 1885 and 1886 show for the former year .5 and for the latter .68 per 1,000.

Regarding its general distribution, both as regards varieties of soil, population and locality, I shall illustrate by quoting from the mortality returns of 1887 :—

Essex, extreme south-west	1.1	deaths per 1,000.
Kent, " "	1.2	" "
Haliburton, extreme north-east	1.5	" "
Muskoka and Parry Sound, extreme north	1.3	" "
Prescott and Russell, extreme east	2.1	" "
York (including Toronto), central south	1.6	" "

These five are selected as the five highest county death-rates from this disease, and a glance at the map shows their distribution to be wholly irregular as to locality. But looked at with a knowledge of the special circumstances peculiar to each district, we at once gain light on the whole subject.

The south-west counties are in many respects a prairie, with much low-lying lands with abundant vegetable deposits and a notably bad water supply, often scooped from shallow wells dug through the decomposing vegetable matter down to the hard-pan. There are, further, many French settlers, from amongst whom it is very difficult to eradicate a zymotic disease once introduced, first because of their generally smaller houses, and secondly the difficulty of enforcing isolation. That to the latter two causes are largely due the great spread of the disease and the high mortality rather than to the special character of the locality is seen in the fact that the settlers in Prescott and Russell are largely of the same class, and that amongst them isolation is very imperfectly carried into effect, while in Haliburton and Parry Sound the relatively limited means of the settlers, their constant intermingling and the difficulty of obtaining medical aid, not to mention their poor houses and often bad water, readily account for the abnormally high mortality. That the mortality of York is so high is due to the fact that of the 3,418 deaths therein 2,688 occurred in Toronto; while 199 of these were due to diphtheria. What the conditions are in Toronto productive of such a high rate were referred to in the 1886 report, and to them might be added the two causes referred to above as common in the less favored rural localities, viz., insufficient isolation of first cases in houses and a permitted mingling with the public before patients have become free from infection.

While, however, the correspondence during the year suffices to indicate only too forcibly the general distribution of diphtheria; it also shows that both physicians and Local Boards are becoming much more fully alive to the contagious character of the disease, the causes which prove favorable to its existence and spread as well as to its fatal nature, and to the vigorous measures requiring to be taken if its ravages are to be stayed. More than any other, except typhoid, it tends to reappear in its old haunts smiting one family after another who may successively inhabit the same premises, and attack even at different times persons who have before suffered from it. It will not be devoid of interest to cull from the official correspondence a few of the local conditions which were associated with outbreaks.

1. At Lindsay in the end of January a severe case of diphtheria was imported *via* the Victoria Railway from Kinmount, a small frontier village. The man who was sick had been taken ill while acting as cook in a lumber shanty near Kinmount. Dismissed from the shanty, he was forced to seek some settlement where a physician could be found. He went to Kinmount and stayed in the hotel there until driven from thence, and as there was no place in the village where such persons could be received, he took rail to Lindsay, where he was taken charge of by the Local Board and put in a temporary hospital provided.

2. A man taken sick at Fenelon Falls in August consulted a physician, who pronounced the illness diphtheria. The physician prescribed and the man went out, having been told to return for the medicine. He did not return, but took the next train north to his home near Minden. The result was that, though the case proved so mild that the patient went out and in and did not isolate himself from family or public, some four or more cases occurred in the family, with three deaths; a young missionary who volun-

teered his services as nurse to these young children became very ill, while the sum total of cases amounted to a considerable number.

3. At the Penetanguishene Reformatory for Boys, a place with two hundred inmates, situated at a distance from the village and with most salubrious surroundings, an outbreak took place at the close of 1887, and in spite of the greatest vigilance and care in the matter of isolation sixty-five cases had occurred amongst the boys and a number in two or three families of the guards who went out to their homes daily. The building, built many years ago as a military barracks, had had the basement paved with flagging-stone, and the soil, from washings, had become saturated with organic filth. At some later date steam-pipes had been laid, owing to the old-fashioned construction, under board floors in the wings and passages; leaks of steam at places had caused such to become damp, and the confined spaces beneath were a hot-bed of fungoid growth. The construction favored the upward rise of the basement air, and until these whole spaces were cleansed and disinfected, the steam-pipes re-laid in proper position and the old decaying floors removed the infection persisted. What early diagnosis and prompt isolation and treatment mean may be gathered from the fact that of sixty-five cases not one was fatal, while in the few cases, some six in all, in the two families of guards there were three deaths, two children and a mother.

4. In the Welland gaol occurred an outbreak, with a fatal termination, in the person of the gaoler's daughter, a healthy child of thirteen. Wherever contracted, the dark, damp, unsanitary condition of the basement where the family lived, made the case from the beginning a desperate one.

5. A case occurred in the Mercer Reformatory, in one of the girl inmates, which had a favourable recovery. From this one, none followed. A cess-pool at the base of a grating in the playground seemed the immediate cause, since, had it been in the milk supply obtained from outside, more would with certainty have occurred in other inmates. These isolated cases in public institutions are referred to as being remarkable, inasmuch as the circumstances, from closest enquiry, made it in the case of both reformatories extremely improbable that the first cases were imported ones. The difference between the results in the two, one an old building undergoing repair and the other a new building in first-class sanitary condition, is both interesting and instructive.

6. A clergyman at Frome, in Elgin county, stated that five of his children had malignant diphtheria, with one death. He lived seven miles from St. Thomas, and no other cases had occurred in the neighbourhood during the year, and the children had not, as far as he knew, been in any way exposed. The physicians suspected a local well or cistern.

7. Cases occurred at Ottawa in a house where the upper flat was kept as a poultry-house.

8. During April, at the request of the Local Board and School Board of Whitby, an investigation by the chairman and secretary of your Board was held into an outbreak which had begun in June of the year previous, and which had lasted up to that date. The following extracts regarding the outbreaks are taken from diary:

1st. First case in June: boy died; several others in family took it.

2nd. End of June: boy died (went to Room No. 1, Model School); house near railway; bad water in cellar.

3rd. Family near Royal Hotel; in July, school closed; other cases, continued near hotel.

4th. Cases then occurred in three families in west end; some of premises in bad condition.

5th. Another case near bay; distance, two miles from others.

6th. Children attending Rooms 1 and 2 in Model School had, as seen, been sick with the disease as early as October; but, in February, the infant class became a permanent

seat of the infection, to the extent that twenty-nine pupils out of a class of sixty, up to time of inspection, had had the disease, and thirteen deaths had occurred.

7th. At a family, just outside the corporation, engaged in the milk business, diphtheria broke out. Four cases with two deaths occurred. The disease, wherever first contracted, was made fatal by bad surroundings, notably bad water. Chickens were stated to have likewise been suffering from an attack of diphtheria.

In these Whitby cases, it was abundantly manifest that the duration and extent of the outbreak was largely due to imperfect isolation or none at all in first cases; to the mixing of mild cases, before complete recovery, with other susceptible children, and to the incompleteness of the disinfection carried out, both as regards infected persons, clothing and houses.

9. Early in December, reports from Innisfil township, in Simcoe county, indicated the presence of an unusually severe outbreak in the neighbourhood of Churchill village. The disease had been introduced into the locality in the person of a pupil who had returned home sick from Bradford, late in the autumn. He had been mildly sick, and the first cases, being in a good farm-house, were looked upon as little more than ulcerated sore throat.

From there the disease was conveyed to a number of adjoining farm-houses, and obtained a hold amongst the school children. Near by the school-house was a semi-pauper family living in an old log house, and in a most unsanitary condition. Nearly all the children of the house died. The Local Board acted energetically when once the gravity of the outbreak appeared, and much was due to the local physician for his thorough and painstaking endeavours in the matter. Your secretary visited the locality, and advised as to the measures most likely to limit the spread of the disease. Notes from my diary indicate the methods of propagation of the disease, where it had not been known for years, to have been directly due to contagion carried by school children.

10. In October, information was received that malignant diphtheria had broken out in Brighton township, Northumberland. Within a few days eight deaths had occurred, there being three in one family. The action of the Local Board of Brighton was tardy, and the alarm spread to surrounding townships, which called loudly for action. A general surveillance of infected houses and persons was instituted by the three townships in the neighbourhood where the cases were. The following prompt action of the Medical Health Officer was taken, on a telegram being sent from this Department:

Dr. P. H. Bruce :

DEAR SIR,—Your telegram received. On Thursday last, 25th Oct., I visited the diphtheritic district, township of Brighton, and had all the houses placarded, and left the Sanitary Inspector in charge. I reported to the Brighton Board that:—

- 1st. All the school-houses should be thoroughly cleaned and disinfected.
 - 2nd. The cheese factory to be thoroughly renovated, and all hog-pens and hogs to be removed therefrom, as the disease started there.
 - 3rd. Certain wells to be cleaned (naming them).
 - 4th. A nurse to be sent to one of the houses, etc.
- And they acted accordingly.

This disease has been going on since August, and never reported to me or the Board until Tuesday last. The first case (at the factory) died, and I am informed that the school children went in to see the corpse, and from that it got into the school.

I think I have got the disease under control, and shall very likely not lose any more cases.

Yours truly,

N. B. DEAN.

This prompt action was effective, but the Medical Health Officer found difficulty in restraining people from infected houses from going abroad to town or market. The complaint was made, too, that no nurse could be found to go into the infected district.

The following is a curious illustration of how promptness of action frequently characterizes officers of health. A case is referred to your Secretary for opinion, it being that

the Medical Health Officer of Belmont and Methven very properly incurred expense in sending a messenger to Havelock, stating that a man would be prevented from taking his child, dead with diphtheria, to Cobourg, a distance of forty miles or more, the funeral having to pass through Norwood, within said officer's jurisdiction.

Other illustrations from correspondence might be given, further illustrating the many conditions under which the disease appears, or which aid in its extension.

But of the many outbreaks which have occurred those in the unorganized newly settled districts of Muskoka, Parry Sound, Haliburton and Nipissing, lying to the south of Lake Nipissing and the Ottawa River, and in the new railway towns which have sprung up along the Canadian Pacific railway, between Chalk River, near the Ottawa, and Port Arthur, at the head of Lake Superior, have been of the greatest extent and moment. It will be remembered that in the report for 1887, was printed the report of Dr. C. S. Elliott who had acted as a Medical Inspector of the Board and made a visit to some of the points along the railway, south of Lake Nipissing. The earliest complaints this year came from Chapleau, on the C. P. R., north-west from North Bay. Courteous and full information regarding authorities along the line was supplied to the Board by Dr. R. B. Struthers, supervising physician to the Company in this region. He pointed out that in the absence of municipal organization there was no controlling power in these towns over settlers who were not in the employ of the Company, and indicated the necessity for the matter being dealt with by the Government. Practical difficulties were in the way owing to the fact that the machinery of the Public Health Act did not readily admit of application to unorganized districts, and it was doubted whether the powers and duties laid upon municipal Local Boards could, in cases other than the mere handling of contagious disease, be made applicable to the abatement of nuisances, closing of foul wells, etc., and be exercised in these districts.

Regarding the matter, however, the following action taken by the secretary was approved by the Board as per extract from minutes :

August 17th, 1888.

The chairman detailed the circumstances of the recent outbreak of diphtheria at Chapleau as also the action taken by the secretary, acting under his instructions *re* the temporary appointment of Dr. R. B. Struthers, travelling physician of the C. P. R., as a Medical Inspector of this Board, to take action in outbreaks of disease, and in regard to all other matters relating to the public health in the unorganized districts of Ontario, and especially along the line of the C. P. R. west of Chalk River to Port Arthur.

In the interval preceding the time when governmental action might have been taken the disease abated at Chapleau, Schreiber, etc., through the exertions of the C. P. R. physicians at these points, and nothing further was done until November, when renewed reports came from the wide district of Parry Sound and Nipissing of the fatal prevalence there of diphtheria. Your committee on epidemics, at the suggestion of the secretary, instructed Dr. Lehmann, who had been up to this time engaged in smallpox work, to proceed to this north country and obtain as accurate information as possible regarding the extent of prevalence of diphtheria.

The following is a copy of his report on the subject :—

DECEMBER 12th, 1888.

To the Members of the Provincial Board of Health :

GENTLEMEN.—I have the honour to present to you report of work done in the Districts of Parry Sound, Nipissing and Algoma, in connection with the outbreak of diphtheria. Beginning at the Village of Sundridge, in the organized Township of Strong, on the Grand Trunk Railway about forty-five miles south of North Bay, last year there were twelve cases of diphtheria and five deaths in the Township of Strong, a little west (five miles) of Sundridge. With a Board of Health and an active Medical Health Officer, Dr. Toole, it was soon stamped out. This year there has been a number of cases of a very mild type of diphtheria with one death.

South of Strong is the Township of Armour, (organized) including Burk's Falls, and West Chapman, also organized with the Village of Magnetawan, at both of which villages there are

licensed practitioners. To the north of Strong are the Townships of Machar and Laurier, and directly east Joly, all unorganized, and all lying conveniently to be handled by the Medical Health Officer at Sundridge.

In all of these townships there have been a large number of cases of a mild type of diphtheria, the type becoming more malignant as we go north towards Lake Nipissing, and west in the townships lying to the south of and bordering on French River. North of Laurier along the line of the Grand Trunk Railway is the Township of Himsworth, unorganized, including the Village of Powassan. West of Himsworth is Gurd, also unorganized, and including the small Village of Commanda.

North of Himsworth is the Township of North Himsworth, organized, and including the Village of Callender on Lake Nipissing.

West of the Townships of Nipissing and Gurd are Patterson, Hardy, Pringle, Mills, McConkey and Wilson, all unorganized, and containing a considerable population of settlers and lumber men, having a very large number of cases of diphtheria with a percentage of deaths very large.

No medical attendance, sanitary condition very bad, both as to dwellings, water supply, garbage and privy regulations.

A Dr. Kidd is said to have lately settled at French River P. O., near the mouth of French River, and goes as far east as the edge of McConkey, and the doctors at Powassan and Sundridge go as far west as Commanda; but the half dozen townships above named, lying between, are entirely without medical help and the disease goes on without any attempt to check it. Dr. Porter at Powassan has had under observation in the village and country surrounding thirty-eight cases with eleven deaths.

The water-supply of the district at all times bad is this year much worse on account of the exceedingly dry summer followed by very wet fall. The wells are nothing more than holes a few feet deep dug in the beaver-meadows, which dried up in the summer and when the fall rains began filled up with surface water poisoned by decaying animal and vegetable matter, the privy and stable being very often in close proximity to the so-called well.

The village and townships surrounding being unorganized, isolation is impossible; fumigation is carried out in some cases in the village but most people in the country are very poor and careless about such matters. In many cases there is no money to pay for carrying out the regulations and in none is there law to enforce them.

About twenty miles north of Powassan is North Bay a rapidly growing village at the junction of the G. T. R. and C. P. R. Railways, in the Township of Widdifield.

The village is not yet incorporated, but the township is organized and has a very efficient Board of Health with Dr. Carruthers, Medical Health Officer, Mr. Ferguson, Reeve, and Chairman of the Board, and Mr. Cornack, Druggist, Secretary. It is expected that the village will be incorporated next year, after which the Board of Health will endeavour to get enough assistance from the government and railroad companies to enable them to build a hospital.

There has been so far this season at North Bay, sixteen cases of diphtheria with four deaths. The first case occurred in Dr. Carruthers' family. An old privy of construction days, situated on the next lot and very close to the doctor's house was removed a short time before the child took ill. The stirring up of the old privy matters may have had something to do with it. The water-supply at present is largely drawn from the lake by teams. There are also some wells which generally speaking are in pretty good condition, but a few of them bad. In the houses where diphtheria occurred, people were using what appeared to be good water.

Drs. McMurchy and Howey, of the Canadian Pacific Railway, are also at North Bay.

There are some good townships north of North Bay, and the Government have opened a new road from North Bay to Lake Temiscaminigue, which will be rapidly followed by settlement and lumbering operations, and if better regulations are not observed an outbreak of diphtheria or some other contagious disease in a year or two will probably occur.

East of Lake Nipissing are organized Townships of Ferris and Bonfield and the country is partially settled all along between the lake and the Ottawa River.

In all this territory there have been a very large number of cases of diphtheria, but of a mild type and few deaths.

There is a licensed Dr. at Mattawa.

West of North Bay there are scattered settlements along the line of railroad for seventy or eighty miles. The Township of Springer, including the Village of Sturgeon Falls, is organized, but there is no doctor between North Bay and Sudbury, where there is extensive copper mining, and the mining company have a doctor. North-west of Sudbury, for several hundred miles along the main line there is neither settlement nor lumbering and never will be. Chapleau, a village of about 500, about 250 miles from North Bay, and composed entirely of railroad men and traders who supply them, has had an outbreak of the most malignant type of diphtheria. So far, eighteen cases with ten deaths. The Canadian Pacific Railway Company have a hospital and Dr. Arthur is the Canadian Pacific Railway surgeon in charge. Dr.

Struthers, who is stationed at Algoma Mills, was also at Chapleau assisting Dr. Arthur at the time of my visit.

The Canadian Pacific Railway are very liberal, and although they had gone to several thousand dollars expense for draining previously at North Bay, yet when the diphtheria broke out, at the suggestion of the doctor, the Company put in a new drain which cost \$2,200.

The company also have very good water pumped up from the lake and offer to supply all the people from their tank free of charge.

They can compel their own employees to use proper water and clean up their privies and garbage; but the other people who have bought lots and built their own houses do just as they please, and the consequence is a most deplorable condition of sanitary affairs. The land is low and swampy, water can be obtained by digging a few feet. The soil being of coarse sand and gravel is very porous and allows the soakage from the privies, stables and garbage heaps to get into the wells.

At Schreiber, 150 miles north-west of Chapleau, a few cases occurred with conditions very similar to Chapleau.

The thing most urgently needed in all these unorganized districts, is some person whether medical man or not, who will have sufficient authority to compel people to clean up their privies and garbage heaps and use the best water available.

For the Parry Sound District, the doctors of Parry Sound, Magnetawan, Burk's Falls, Sundridge, Powassan and French River, might be appointed Medical Health Officers for the respective townships in which they live, and the unorganized townships adjoining them, and then if a couple of other doctors were given some encouragement to settle in the district, for instance, one at Commanda or a little farther west, and another say at Byng Inlet, between French River and Parry Sound, the District of Parry Sound would be pretty well supplied. The Powassan District might include the neighbouring townships of Nipissing, North Bay, Mattawa and Sturgeon Falls, which might also be centres for districts. While farther west along the main line of the Canadian Pacific Railway where there are no settlements might be conveniently and cheaply handled by the Canadian Pacific Railway doctors. Their having free passes over the railroad would enable them to do the work of inspection at much less cost.

Your obedient servant,

(Sgd.) W. LEHMANN, M.D.,
Medical Inspector.

Action had not been taken in the matter when the year expired. As it is desirable to give the whole subject in a connected history, I shall here state what has been done up to date of writing. At an early period in 1889 during the sitting of the Legislature Mr. Armstrong, M.P.P. for Parry Sound district, brought the matter before the Government, and upon the adoption of your secretary's report, herewith subjoined, on the subject the following recommendation adopted by the Board was transmitted to the Hon. J. M. Gibson, the head of the Department:

The following motion was then carried:—"That the Board would recommend that the Public Health Act be amended so as to empower the Provincial Board to appoint for unorganized districts Medical Health Officers and Sanitary Inspectors, who shall have power to superintend and execute, under the direction of the Provincial Board, all regulations issued by said Board under clause 14 of said Act, such appointments to be made subject to the approval of the Lieutenant-Governor in Council, and further, that the Board form a committee to wait upon the Government to urge the adoption of the proposals included in the resolution just adopted with regard to the appointment of Medical Health Officers and the amendments to the Act necessary for this purpose."

*REPORT OF THE COMMITTEE ON EPIDEMICS RE DIPHTHERIA IN THE FRONTIER
TOWNSHIPS IN THE NORTHERN DISTRICTS OF ONTARIO.*

JANUARY 6TH, 1889.

To the Chairman and Members of the Provincial Board of Health:—

GENTLEMEN.—In again referring to this subject, which during the last two years has from time to time been brought before your notice in reporting outbreaks in localities extending from the Haliburton district on the east to Chapleau on the Canada Pacific railway, north-west of North Bay, and Manitoulin Island and Cockburn Island to the west, your committee feel that

the exigencies of the case are such as to demand such comprehensive action as will aid in recommending and establishing some permanent system of dealing with outbreaks in these outlying districts.

Last year our Medical Inspector, Dr. C. S. Elliott, reported on the North Bay and Sundridge outbreaks, your Secretary has reported on outbreaks about Lindsay, Kinnmount and Minden, and Dr. Lehmann, whose report is herewith incorporated, has further reported on the districts south and north-west of North Bay. The reports in every instance show with sad iteration the progress of this fatal endemic disease, at times becoming epidemic, in the sense that attacking all the members of one or several families in a neighbourhood it not infrequently sweeps them all away, or leaves only heart-broken parents to mourn their offspring and their fruitless attempts to bring up a family of children, not more as companions to them in their isolation in the scattered settlements of the back-woods than as helpful hands to aid in that labour so necessary there to obtain, not affluence, but comfort in their declining years in homes whose exiguous means is aptly defined by the classic expression *angusta via*, the euphemism of poverty.

To ameliorate the conditions of life amongst those hardy settlers, who, with adventurous spirit, have chosen to leave their homes in older parts of Canada and hew out new ones from the forest, or who in many cases have, with the spirit of our forefathers, been lured from England to the back-woods by the siren voice of the emigration agent, who has filled them with dreams of an Arcady where the rivers swarm with salmon, and the cold winter is but beautiful in its opportunities for recalling the myth of Diana and re-establishing the English hunting-ground in a western land; in both cases, with varying degrees of necessity, our work remains ever the same. The conditions briefly summed are,—

1st. Sparse settlements; these may be made up of from two or three families to three or four hundred settlers in a township.

2nd. Very limited means in the great proportion of instances, making the result a small one, two or at most three-roomed houses. We have recently had by Professors Carnelley and Jamieson, and just now Dr. Russell, of Glasgow, illustrations of how mortality there increases regularly with decreasing rooms; but there can be no surprise that with infectious disease and its saprophytic decomposition, the products of exudation in the pharynx, etc., being constantly exhaled in a house 12x16 feet, air with closed doors becomes that of a charnel house, and as deadly to the helpless children awaiting to become in turn the victims, and not seldom to the worn-out and heart-broken mother who has seen one after another of the lambs taken from her fold.

3rd. House to house communication, for while settlement is sparse, it is most common to find that through accident of location by lake, stream, or on good land, the few settlers in a township tended to build convenient of access to one another. Pressing need in a stricken house and human sympathy cause one's neighbours to go out and enquire, and at times go in to aid in nursing, or at any rate sit down to discuss the situation, thereby doing all necessary to carry the infection on their clothing from so pestiferous an atmosphere to their children at home. Thus Dr. Curry, of Minden, has stated that along one concession line, of a number of houses, only two families escaped having cases of diphtheria, and they were new-comers not acquainted with the previous settlers.

4th. Distance from medical aid and supplies and absence of municipal sanitary supervision and control. This is exemplified by Dr. Lehmann's report on the Townships of Nipissing, Gurd, Patterson, Hardy, McConkey, etc., all unorganized, containing a considerable population of settlers and lumbermen, having a very large number of cases of diphtheria with percentage of deaths very large, no medical attendance, sanitary condition very bad both as to dwellings, water supply, garbage and privy regulations.

5th. Lumber camps. These complicate the problem very notably. Not only do the crowded shanties become, as it were, permanent seats of infection, affecting susceptible persons from time to time during successive winters, but sick men from them are sent out to the nearest settlement, to which they not infrequently spread the infection, or spread the disease still further by travelling in hot and crowded trains (to southern points where they live) to seek hospital and medical accommodation. Such are the prominent factors in the problem. While it is true that many of the same conditions prevail in well-settled communities, yet it may fairly be said that while in the latter the people are in a position to help themselves, in this northern country the conditions are such as to make action impossible. Few settlers, poor and isolated, are not organized into a municipality, and even if they were the few hundred dollars that they raise annually are spent in roads and bridges.

Schools in these new districts are largely supported by government. The lives of the settlers must, to some extent, come under theegis of a paternal government.

But how to do this best is the problem. In the materials collected we have it made evident that there are a number of prominent points in the different districts from which work will have to be done.

Beginning as Dr. Lehmann has done in his report, we have:—

1. Sundridge District, Dr. Toole, Medical Health Officer. South (a) Armour, organized, including Burk's Falls Village, Dr. Caughell; West (b) Chapman, organized, including Magnetawan Village, Dr. Walton; North (c) Machar, unorganized; North (d) Laurier, unorganized; East (e) Joly, unorganized.

2. Powassan District, Dr. Porter lives there. (a) Himsworth, unorganized, includes Powassan Village; West (b) Gurd, unorganized, Commanda Settlement; North (c) North Himsworth, organized, includes Callender; Northwest (d) Nipissing, organized; Northwest (e) Patterson, Hardy, Mills, McConkey, Wilson, unorganized, lumber camps.

3. Suggested new district to be worked from Commanda.

4. North Bay District, Dr. Carruthers, Medical Health Officer (in organized Township of Widdifield); North (a), (b), (c), (d).

East Nipissing District. Mattawa has a physician; (a) Ferris, unorganized; (b) Bonfield, unorganized.

6. North Nipissing District. (a) Springer, organized, including Sturgeon Falls; (b), (c).

7. Sudbury District. Physician in Sudbury.

8. Chapleau District, Dr. Arthurs (C. P.R.), unorganized.

9. Algoma Mills District, Dr. Struthers (C. P. R.)

10. Schreiber District.

11. Byng Inlet.

12. Manitoulin Island District.

13. Haliburton District, townships.

14. Minden District, townships.

15. Kimmour District townships.

This summary of districts, while tolerably complete, might yet be extended; but for present purposes temporary organization on this basis may be considered. Without discussing the various possible ways of dealing with the problem, it may be said that after due consideration the following plan would seem to suggest itself as being the most practicable.

1st. For the districts named, with such alterations as a more intimate knowledge of the directions in which communications are found easiest, it is desirable that physicians be appointed who might be called District Medical Health Officers, and who, through such amendment of the Public Health Act as the law officers may find necessary, would be clothed with all the powers at present laid upon Medical Health Officers of municipalities, and such other powers as the conditions may require. Their duty would be to exercise a general sanitary supervision of their districts, and give the District Sanitary Inspectors such aid in the stamping out of outbreaks of disease as the emergency might demand. They need not be, while regularly appointed, expected to act except when specially called upon by the Inspectors.

2nd. For each of the various settlements, separated often by many miles, there would seem to be but one method of giving them effective aid, and that would be by having in each some competent man, a provincial policeman where possible, appointed a Sub-district Sanitary Inspector, with all the powers at present laid upon sanitary inspectors of municipalities, together with such additional duties as the conditions might demand. Amendment to the Public Health Act would in this case likewise be needed. These officers would be on regular duty at all times, and on them would devolve the every-day inspection and supervision of the sub-district set apart to each.

Should a case of zymotic disease occur, he should be empowered to at once, by methods prescribed from time to time by the Board, so as to isolate the patient, or family, as the case might be, see that the District Medical Health Officer—if no family physician was available—give professional services at their own or the public expense as each case may require.

Water supplies, cleanliness of premises, and such regular sanitary work as is carried on in any efficiently supervised municipality, would give these officials abundant work, while it would educate the people to the observance of sanitary law, until such time as the development of settlement would cause them to be organized on a self-governing basis. The work of organizing this system will demand much careful attention in order that the most effective results can be obtained, and the fewest possible mistakes in details made.

Your Committee would recommend the adoption of the report, and that a Committee of the Board be empowered to present the urgency of the matter to the Minister of the Department, in order that he may take such measures as will best carry out the views of the Board.

All of which is respectfully submitted.

(Signed)

FRANCIS RAE.

C. W. COVERNTON,

PETER H. BRYCE,

Committee on Epidemics.

This report is but a repetition and extension of the principle set forth in your secretary's report *re* the Haliburton district cases already referred to. His report thereon is as follows :—

TORONTO, April 7th, 1888.

To the Chairman and Members of the Provincial Board:

GENTLEMEN,—Owing to information contained in letters and telegrams from Dr. P. P. Burrows, Medical Health Officer, Lindsay, and acting upon instructions of the Hon. Mr. Ross, to whom a deputation from the County of Victoria had gone representing the dangers resulting from the transportation of cases of diphtheria on railway trains, I went to Lindsay on the 11th of February, and telegraphed the officers of Boards of Health up the Victoria Railroad to meet me there the next morning.

A meeting was held in the Benson House, and the whole subject of how best to deal with the question of isolating cases of diphtheria, etc., in the back townships was discussed. There were present: Mr. Walters, Mayor; Col. Deacon, Chairman Lindsay Local Board; Dr. Burrows, Medical Health Officer; Judge Deans; Mr. Barron, M.P., Lindsay; Dr. Curry, Medical Health Officer, Minden; Mr. Prust, Secretary Local Board, Haliburton, and your secretary.

The following facts were obtained:—According to Dr. Curry 280 cases had occurred in his district within the past three years. Mackintosh's Camp, in Snowden Township, became infected from a person from MusLoka. Scotch Line settlement had had cases in every house but two. A number of instances were given by those present of outbreaks that have occurred through cases introduced from other localities.

The importance of adopting thorough and energetic measures was recognized, and the necessity of making arrangements of a permanent nature was admitted. Isolated hospitals will have to be erected by municipalities, or several municipalities, at convenient centres, the expense thereof to be levied in proportion to assessment. Each municipality should pay the charges for its own patients sent to the central hospital. Patients from outside places, such as the shanties, should in every case be isolated by the Local Board of Health in whose jurisdiction they occur. The charges for maintenance and physician's services should in such cases be borne by the patient himself or by the lumber company in whose employment he may be, or, where there is no such provision, then the Provincial Board of Health may be fairly called upon to pay. The local hospitals should make application, under the Act *re* Aid to Public Charities, for a Government *per diem* subsidy for all patients. The various representatives of the Local Health Boards requested Mr. Barron and myself to urge upon the Government the adoption of the plan herein outlined as being reasonable and fair, and as promising to be effective and thorough. The adoption of some such plan is highly desirable, and the outlay will prove judicious in the end. Thorough precautionary measures should be adopted, and any reasonable and practical outlay in that direction will prove to be money well expended.

The conclusions arrived at in this connection, I may say, seem to me to be applicable to the whole new territory, and is the best, and indeed the only practical means of dealing with contagious diseases in either outlying new portions of the Province or in crowded centres, and it seems to me highly desirable that the Board should deal with the question of isolation or contagious diseases hospitals. Placarding of houses for the commoner contagious diseases of children is in practice inapplicable and fails of its objects, and it would seem that the Board has the duty forced upon it of a reconsideration of the whole subject of the limitation of contagious diseases.

I have the honour to be,
Your obedient servant,

PETER H. BRYCE.

Acting at once upon the recommendation of the Board made on the adoption of the report dated January 6th, 1889, Dr. Hodgetts and Dr. Wade were authorized by the Minister to proceed, under the direction of Dr. Caughell, of Burk's Falls, to the Commanda and Dunchurch Settlements in Nipissing and Parry Sound Districts.

As to the condition of affairs and the nature of the difficulties to be overcome, I cannot do better than present abstracts from the weekly reports sent me by these two gentlemen.

COMMANDA, February 24th, 1889.

P. H. BRYCE, M.D.:—

DEAR SIR,—In accordance with instructions received from the Provincial Secretary, when appointed to this position October 13th, I have the pleasure of making the first of my weekly reports.

2* (B. H.)

Leaving Toronto Friday morning February, 15th, we were detained upon the road by reason of a slight railroad accident, thereby preventing our (Dr. Wade and myself) calling upon Dr. Caughell, of Burk's Falls, that night. However, upon February 16th, we waited upon him, meeting in conference, also with Mr. Armstrong, member of the Local Legislature for this district. As there were reported to be several cases at Dunchurch, it was deemed advisable for Dr. Wade to proceed at once to that place, myself to drive northward with Dr. Caughell.

On Saturday, the opportunity offering, I visited Emsdale, (10 miles) township Perry, making enquiry of the hotel keeper and shop keepers, relative to the prevalence of diphtheria, etc., in that district; the report is *none* there.

Monday morning, February 18th, we left Burk's Falls, driving 17 miles to Magnetawan. Here we called on Dr. Walton, who reported none at present in his locality; he has had two cases this year, (one at Spence died.) From here we proceeded to Mecunoma P.O., 12 miles, remaining for the night.

Tuesday 19th, after leaving Mecunoma, called at School No. 1, Lount. The teacher, no illness among the children. Here I left pamphlets and where I could be found if wanted; also called on Rev. Mr. Bollander, (German), he did not know of any cases now. Arrived at Commanda (12 miles) at noon. As there were reported to be several cases at Commanda Lake, distance 12 miles, we proceeded there after dinner. The teacher School Section No. 1, Paterson, did not know of any cases just now; the school had only just been re-opened, after being closed some time on account of the prevalence of diphtheria. Here I visited three farmhouses, in one they had lost two children with the disease, (January 7th), at the other two I found nothing of the nature of it: When returning to Commanda I found at the farmhouse of John Atchison, 7 miles from Commanda, Boyd Road, two children, John, *et. 2* years and Lily, *et. 4* both convalescent from diphtheria. This house I will disinfect myself, although Mr. Atchison tells me he has done so, but I fear that here as elsewhere, it has been but poorly attended to.

On Wednesday, the 20th, we proceeded to Nipissing, 12 miles, called at School Section No. 1, Gurd and Pringle. The teacher reported no cases since January. Finding School Section No. 2 closed, I made enquiry at the nearest farmhouse; they reported it closed since December 21st, 1888, not to be re-opened until the expiry of six months, reason: prevalence of diphtheria.

At the Village of Nipissing I found two cases of the disease, in the household of Mr. A. McEachren; they had already lost two children, victims of this fell disease. At the time of my first visit, two children were ill, Agnes, *et. 12*, ill for a week, and May, *et. 18*, ill for two days. The house had been quarantined by the Local Board of Health; no medical man had been in attendance since my last visit; both the baby, *et. 10* months and the son *et. 14* years, have been attacked. In this house, as in nearly all those I have yet visited, I find it most difficult to isolate the cases. The houses, often consisting of one common room, are so roomed off where partitioning is resorted to, that the space within the four walls is like a *common* bedroom, kitchen, diningroom and parlour. However, when necessary, I have sheets hung around the bed, which are kept moist with a solution of carbolic acid.

The wife and six children of Mr. Armstrong, hotel keeper of this place, have all been down with this trouble, although they were convalescing at the time of my visit; this place I am having all cleaned, every room, and disinfected.

On Wednesday, February 20th, I visited Powassan, calling on Dr. Porter of that village, his own little boy is at present down with the disease; the doctor knew of no other cases then in or around the village, although he had had about 50 since the commencement of the year.

On Thursday, 21st, drove back to Commanda, 25 miles, calling on the cases at Nipissing on the road.

On Friday, 22nd, drove to Trout Creek and back, 30 miles, found one case there, had been ill for a week and had not received medical aid; the child was then dying from sepsis, and although I did all that could possibly be done in the way of food, better hygienic surroundings and medicine, yet I believe he died in the course of that same night. Before leaving I left full instructions with the parents what to do in case of the death of the child, and also as regards the disinfecting of the house. So soon as I can leave the cases now under treatment, I will visit the place again. One great trouble is that by reason of blocked roads the distance to be travelled is greatly increased, and travel is slow by reason of the heavy roads.

Saturday, 23rd, I drove again to Nipissing, where I found the remaining two of Mr. McEachren's family ill, (as mentioned in a preceding paragraph), the two girls were much better; in both cases the membranes, which when first saw them were firm and tough, had come away; in each case I had applied sol papoid, ($4\frac{1}{2}$ grs. @ zi.)

Five miles north-east on the Nipissing road, I found another case, Samuel Orton, *et. 2* years, he had been ill for two or three days. In the house (18 x 20 feet) were three adults and six children, *one common apartment*. I quarantined the place, and as far as possible isolated the case; child and mother in one corner of the house, using a wooden partition, extending into the room for about 8 feet, and carbolized sheets.



PARRY SOUND DISTRICT.

(Area around Commanda infected by Diphtheria.)



This is a brief summary of my work thus far. So soon as the cases now will permit of my doing so, I will visit and clean, *if it be possible*, the farmhouses of those settlers living on the Alsace road, where the disease has made sad havoc amongst the younger portion of the community.

Trusting the foregoing will meet with your approval,

I have the honour to be,

Dear Doctor,

Yours truly,

CHAS. A. HODGETTS.

DR. BRYCE,
Secretary Provincial Board of Health,
Toronto.

COMMANDA, March 4th, 1889.

DR. BRYCE,
Secretary Provincial Board of Health,
Ontario.

DEAR SIR,—In continuation of my first report, I would review in this the second, the work done from February 24th to Saturday, March 2nd.

February 24th,—Visited the McEachren family in Nipissing; then drove five miles to see Mrs. Orton's child; all five cases were making satisfactory progress; returned that afternoon to Commanda, going from there to visit a Swiss family, three miles distant. The case, however, was not one of diphtheria, at least so far as I could glean from the symptoms and from an examination of the boy. It was most difficult to talk with the family, they being but poorly able to converse in English. I diagnosed follicular tonsillitis, however I took the precautions as if it were a case of diphtheria. It was night when I arrived. In the one common room was a blazing fire, the light from which was all they had to illumine the darkness; as no lamp was to be had, I viewed the throat by the faint flicker of burning slivers of pine.

February 25th—Was called at 5.30 a.m., to go to Nipissing, as the baby and son of Mr. McEachren were much worse. I remained at Nipissing all day, visiting this family three times; the last call at midnight. In the afternoon I visited Mrs Orton; then found the eldest of her girls down. The baby was slightly better.

February 26th—Visited the McEachren family and returned to Commanda. A message having arrived during my absence at Nipissing, asking me to at once proceed to Commanda Lake. After dinner I proceeded thither, (twelve miles); the case, however, was not one of diphtheria. (The people here seemed to have got so scared, that should they have any little trouble whatever with the throat, they jump at diphtheria.)

As there had been a number of cases in this District and the school had been scrubbed and cleaned at the request of the Secretary of School Board, that night I fumigated the place.

February 27th—Drove from the Lake this morning to Restoul, (two and a half miles) to visit the Clark family (supposed case); all however were well; then returned to Commanda; called to see the Atchison family; the children were very much improved.

February 28th—Returned to Nipissing, visiting the McEachren and Orton families. The baby of McEachren's had succumbed to the disease on Wednesday morning, and was buried with proper precautions a few hours subsequently.

March 1st—Drove to Orton's at 8 o'clock a.m., three children are now ill; the last two but slightly attacked; (as these children were weakly things, I had taken the precaution to put them upon a tonic treatment). Upon return to village, visited the McEachren's, who are slowly improving.

In the afternoon I drove down the river four miles to see two Indian families (reported cases). I found them all however well, with the exception of the oldest squaw who had been suffering from a very severe cold. I then returned to Commanda.

March 2nd—Drove three miles to see case diagnosed as tonsillitis; found the boy much better and the house much brighter, lighter and cleaner. The melted snow, instead of flooding into the house, was wending towards the larger stream in little rivulets.

I then drove fifteen miles to Trout Creek to inspect the hotel at that point, and see if instructions given had been carried out. I am pleased to report satisfactorily. Mr. B. has very carefully carried out my instructions; rooms have been cleaned; carpets, the pieces that were in bed-rooms burned, etc.; walls lime washed; each room fumigated; and he is to again wash floors and paint with a solution of hyd. puchlor. I feel I cannot be too particular with these inns or hotels, as I fear in the past they have been centres for the spread of the disease.

The foregoing is my week's work. The great trouble is for me to get horse and cutter, as at present all those fit for anything are busy in the woods, so perforce one has to be content

with anything. The roads in the early part of the week were heavy from drifts, while the sun of the past three days has done much to break them up; nevertheless, I have during the past two weeks covered over 300 miles.

As regards the water at Nipissing, I should like to have a sample of the river water analyzed as of this the majority drink; also a sample or two of well water. Will you kindly instruct me as to this matter.

All of which is respectfully submitted.

Yours truly,

CHAS. A. HODGETTS.

COMMANDA, March, 10th, 1889.

DR. P. H. BRYCE,
Secretary Provincial Board of Health,
Ontario.

MY DEAR SIR.—I have the honour to report the following, being my last week's work. Monday, March, 4th,—drove to Nipissing, where I visited the McEachren family, whom I found improving. The Orton family received two visits this day from me, the first being made about twelve o'clock noon, while the evening visit was at about nine o'clock.

I would here remark relative to the Orton and Harrington children, whom I described in my last report as being huddled together in a shanty 18x20, that since Mrs Orton's baby was taken ill the following others have had it, viz, Clara Orton, aged 13 years; Alice Harrington, aged 2 years; David Barr, aged 10 years, (hired boy); Jessie Orton, aged 5 years; of the five children, these three died, Samuel Orton, aged 2; Alice Harrington, aged 2; Jessie Orton, aged 5; the other two children are doing very well. In this family I fear the directions given (written out) were not faithfully followed, the mothers in their despair resorting to patent medicines and dieting in ways peculiar to themselves, in the last two cases they had ceased giving stimulants for the twelve hours preceding my visit. The only child that has escaped the disease thus far is the baby aged four months. The Local Board of Health attended to the burial of the bodies. In each case the body was buried as soon as the coffin could be made. In the case of one of the children I myself wrapped the body in a sheet soaked in sol. of hyd. puchlor, leaving sufficient in the house to saturate sawdust to pack around it.

March 5th.—I paid an early call on the Orton children and on returning to the village visited the McEachren family, afterwards returning to Commanda.

March 6th.—Not being able to hire a horse I was perforce compelled to remain at Commanda.

March 7th.—In a drifting snow storm I left this 8 a.m. for Eagle Lake, (20 miles); while on the way a messenger overtook me, asking me to visit a child ill at Rye P.O., Nipissing Road, 7 miles below Commanda. It proved to be a case of diphtheria. The child Olive Mullin, aged 3, lives at Nipissing and had only been removed a few days previously to where I attended her; the father informs me that for some weeks past he has kept his wife and two children upon an island on Lake Nipissing, thinking thereby to escape the trouble, but the house being cold he brought wife and baby home to it, bringing the little girl down here (20 miles).

In this case I was able to secure an isolated room with two members of the family to act as special nurses; there are no children in the household.

I arrived at Uplands P.O., Eagle Lake late in the evening.

My reason for visiting this place was, I had it reported that at least two families had scarlet fever.

March 8th.—I visited three families in this locality in two of which the children had been ill with the scarlet fever; and were now in the stage of desquamation.

The two families live about eighty rods apart; the disease appeared simultaneously in both houses, (3 weeks ago) in one that of Munroes. Dr. Toole of Sundridge saw the first case pronouncing it scarlet fever, the Church children he did not but sent them medicines.

The names are as follows, in order; Munroe's,—J. Alexander, *et.* 8; Percy, *et.* 5; Maggie, *et.* 6; Jessie, *et.* 3; Frank, *et.* 4; baby, *et.* 10 months. Church's,—Charlie, *et.* 5; Martha, *et.* 14; Susan, *et.* 7; Francis, *et.* 2.

These families were very much astonished when I told them how dangerous it was for them to be mixing with other people and that they must consider themselves quarantined for a period of seven weeks dating from the time the last child took it. I gave instructions how to heat the children and left them some tonic medicine. I also visited the Quirt family, seven children, Muskoka Road, but found here nothing more serious than tonsillitis. This day (8th) I returned as far as Rye, when I remained up part of the night with the little girl (Olive Mullen).

March 9th.—Visited the child again this morning, afterwards drove nineteen miles to Nipissing; after tea visited the McEachrens and drove out to see the Ortons, the child Jessie dying while I was there; returned to Nipissing at eleven p.m.

March 10th.—Visited the McEachren family and then returned to Commanda.

The roads during the past week have been very heavy from the drifting snow storms which prevailed for the first three or four days of the week.

All of which is respectfully submitted.

Yours truly,

CHAS. A. HODGETTS.

COMMANDA, March 17th, 1889.

DEAR DOCTOR,—I have much pleasure in transmitting this my fourth weekly report of diphtheria outbreak in Parry Sound District.

March 10th, before leaving Nipissing I visited the McEachren family, all of whom were progressing favourably. Drove to Commanda in the afternoon.

March 11th, in the morning visited the child at Rye, and in the evening was called six miles to visit a child on the Westphalia Road. The child, Willie Boulter, aged $3\frac{1}{2}$, presented no other symptom but that of slight fever (100° F.). It was in this house that the case of tonsillitis had occurred, which I reported two weeks ago. The family are Swiss, and live huddled together in the most miserable and dirty place it has yet been my lot to visit. I gave instructions to the parents to send for me should the child become worse, and that I would leave Commanda for Nipissing upon the Wednesday.

March 12th, again visited the case at Rye, which was progressing very favourably indeed.

March 13th, drove to Nipissing, and upon this and the 14th visited the Ortons twice, also the McEachrens. The infant of Mrs. Harrington, the only one not having had the diphtheria, was ill with pneumonia. The other two children (Mrs. Orton's daughter and hired boy) were doing well.

March 15th, returned to Commanda, and from there went to the Swiss family. It appears the child had taken worse on the Tuesday, but they had not called for me until the Thursday, and in the meantime, according to their own statement, they had given the child little or no nourishment, just because, to use their own words, "the child won't take it." This proved a case of diphtheria, the little boy dying from blood-poisoning and asthenia. I feel sure this case was lost through the stupidity of the parents. Either they won't understand plain English, or can't. In this case there appears more of the former than the latter. Now three others of the family are down with the malady. One great trouble in this case is to obtain sufficient milk for the children, the father having to travel miles for it, none of the neighbors about having milking cows.

The filth about this farmhouse is terrible. Now that the snow is melting the place is surrounded with stinking barnyard mud. The interior of the house is beautifully decorated with ancient cow dung. The house itself is about 15 x 24 interior measurement, and is the abode of eight or nine people.

March 16th, I visited the Rye case, driving afterwards to the Swiss family.

I am very much afraid, now the season has begun to break, that I shall have perhaps other cases very similar to the above. It would require a posse of police to keep watch and ward over some of these stupid foreign settlers.

Enclosed you will find a rough map of my district, with position of cases marked. Before my return I trust to be able to make one out more in full.

All of which is respectfully submitted.

Yours truly,

CHAS. A. HODGETTS.

P. H. BRYCE, ESQ., M.D.,
Secretary Provincial Board of Health,
 Toronto.

COMMANDA, March 24th, 1889.

P. H. BRYCE, Esq., M.D.,
Secretary Provincial Board of Health,
 Toronto.

DEAR SIR,—I have the honour to report as follows of my past week's work :—

March 17th, visited the Boulter family.

March 18th and 19th were spent in going to Nipissing, visiting the McEachren, Orton and Harrington families. I also went to Orton's house, inspecting it and giving instruction as to the proper disinfection of the same.

At Nipissing I inspected Mr. Armstrong's Hotel, which he had finished cleaning and disinfecting.

It was late in the evening of the 19th when I arrived back at Commanda, the roads being very heavy, necessitating my walking for some miles.

March 20th, visited the Boulter family, whom I found slowly improving.

March 21st, visited the case at Rye, from which place I visited a family some two miles back in the bush, reported to be down with diphtheria, but am happy to report the said to be incorrect. (The people are so panicky that with the least sore throat they send for me, necessitating my travelling many miles. Of course I must go to make sure).

March 22nd, 23rd and 24th, each of these days I visited the Boulter family, having to walk the greater part of the distance each day, there being no farmhouse near by where I could remain the night.

These children are slightly on the mend; their constitutions are so frail that convalescence will be somewhat prolonged.

I am pleased to be able to report no new cases during the past week.

I find that the majority of the children throughout this district have never been vaccinated. Could I not be furnished with vaccine, and let it be known that the children could be vaccinated by me? Such a measure might save further trouble in this district as far as regards smallpox.

I have the honour to be,
 Yours truly,

CHAS. A. HODGETTS.

COMMANDA, March 31st, 1889.

DR. P. H. BRYCE,
Secretary Provincial Board of Health,
 Toronto.

MY DEAR DOCTOR,—I have the pleasure of submitting my weekly report as follows :—

Sunday, March 24th, I visited the Boulter family, walking the six miles, as the road was impassible with a sleigh or buggy.

Monday 25th, I went to Nipissing, inspected Mr. McEachren's house and released them from quarantine; also visited a supposed case a mile out of the village.

Tuesday, 26th, early in the morning was called to a case of sore throat; walked the five miles to Harrington family: also inspected Mr. Orton's house, which had been thoroughly disinfected and cleaned.

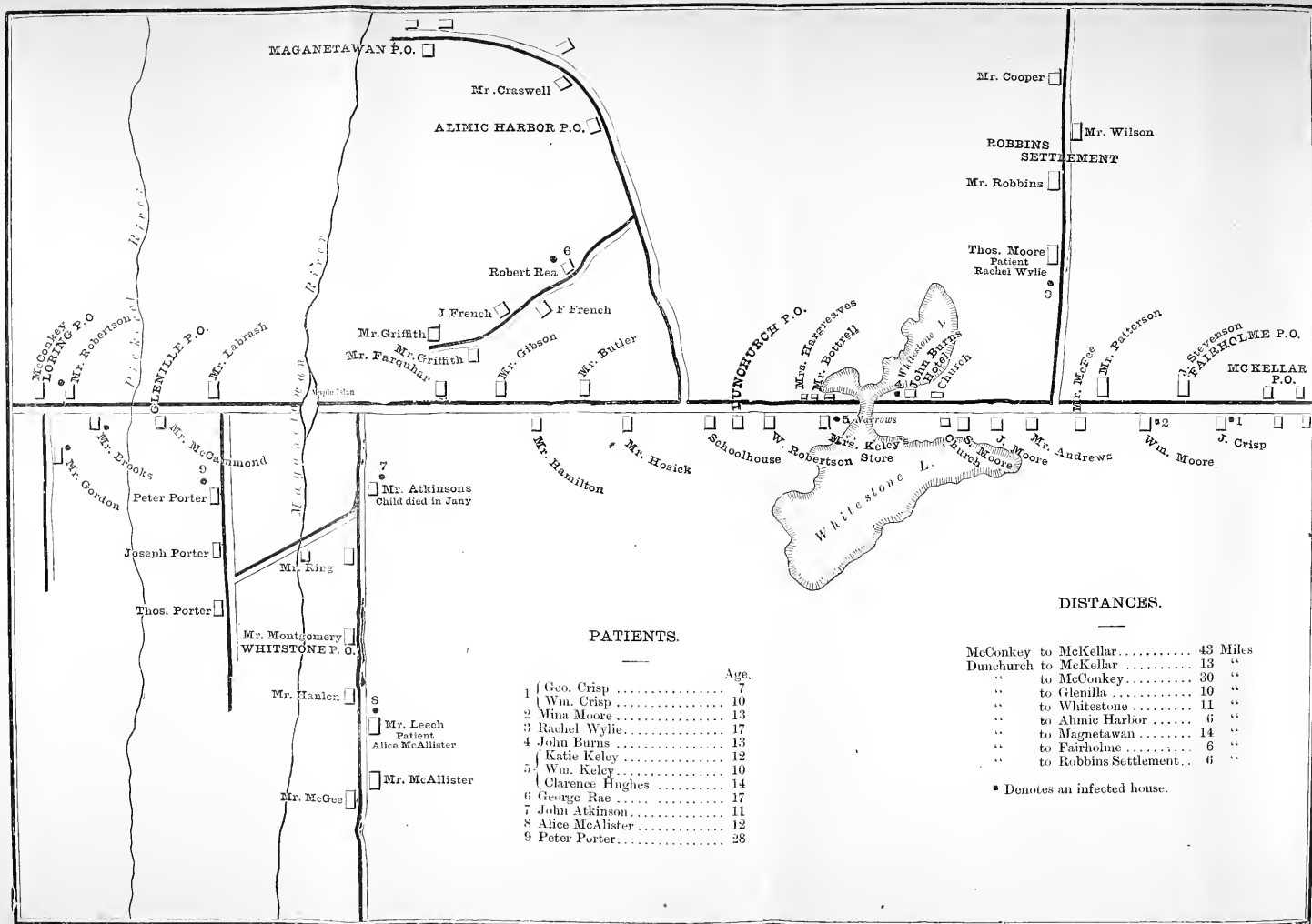
Wednesday, 27th, in company with the Secretary of the Local Board of Health, I visited two supposed cases some six miles from Nipissing, on the Powassan Road. There, however, proved to be no truth in the report as given to me by a neighbour. We afterwards inspected the houses upon Alsace Road, Township of Nipissing, in which diphtheria had been. Two of the four had been properly disinfected and lime-washed within; bedding and clothing also. Another had been washed simply. Here I ordered the walls to be limed within, and all the clothing and bedding disinfected. At the fourth house, Schafer's, in which six children had died, I found nothing had been done, and the husband was away in the shanties. The woman could not understand English. In this case I will see the Local Board, which meets in Nipissing to-morrow, and take steps at once to put the shanty in a proper sanitary condition.

Thursday, March 28th, from Alsace Road I returned to Nipissing, having to change from sleigh to wheels. From there I returned to Commanda.

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Friday, March 29th, I visited the Boulter family and found that the baby was now ill with the disease. Before going I had replied to your letter in which I reported only three cases in this house. This now makes a fourth in the first week of the disease.

Saturday, I again visited the Boulders, returning to Commanda and driving to Rye to see the child Mullin, who will be free on Tuesday next. In this house the house and clothing has been fumigated, bedding burned, bedstead washed with hyd. puchlor, and rooms lime-washed.

The Boulter family are in wretched circumstances. I have had to provide them with milk, etc. If no fresh cases occur I think perhaps I might see this family over and then return. They are some sixteen miles from any doctor.

With kindest regards,
I remain yours truly,

CHAS. A. HODGETTS.

COMMANDA, April 9th, 1889.

DR. P. H. BRYCE,
Toronto.

MY DEAR DOCTOR,—In prospect of my returning next Monday to Toronto, I have completed disinfecting the houses, and have spent the last few days visiting the houses in the Barrett Settlement, where cases occurred some months ago. Travelling, however, is very difficult now, on account of the breaking up of the roads.

The Böler family are now doing well.
No new cases have been reported.

With kind regards,
I remain, yours truly,

CHAS. A. HODGETTS.

DUNCHURCH, PARRY SOUND DISTRICT. February 19th, 1889.

PETER H. BRYCE, M.D.,
Secretary Provincial Board of Health,
Toronto.

DEAR DOCTOR,—I arrived at Burk's Falls at 12 o'clock on Friday evening.

On Saturday morning, following the instructions of the Provincial Secretary, I called upon Dr. Caughell, and consulted with him as to the best mode of operating in the affected districts, and as to the locality where it would be advisable for me to locate.

Dr. Caughell thought it unnecessary to spend any time in visiting different localities, but advised me to proceed at once to Dunchurch, where it was reported the epidemic was just breaking out, and I accordingly acted upon his advice.

Mr. Armstrong, who represents Parry Sound District in the Provincial Parliament, also advised me to locate at Dunchurch.

Providing myself with a small quantity of drugs, as my stock from Toronto had not arrived, I immediately set out for Dunchurch, and reached here at 6 o'clock on Saturday evening.

Dunchurch, situated on Whitestone Lake, is a small village, but contains a large number of children, there being over 70 names on the Public School register.

Two deaths had occurred from diphtheria previous to my arrival; Katie Kelsie, aged 12 years; William Kelsie, aged 10 years. Two children were suffering from the disease at the time of my arrival; John Burns, aged 13 years; Clarence Hughes, aged 14 years.

On Sunday afternoon, I was called to see Geo. Rae, aged 17 years, and found well marked symptoms of diphtheria. I at once isolated him from the rest of the family, with the exception of one attendant.

On Monday, I closed the Public School, the store owned by Mrs. Kelsie, where Clarence Hughes is confined, and the hotel of John Burns, father of the patient John Burns.

All intercourse except that which is absolutely necessary, is prohibited with the houses in which the disease is located, and isolation enforced to the fullest extent possible, and I am hoping to prevent a further spread of the disease.

At Loring, 30 miles north of Dunchurch, the disease has committed terrible ravages; but there is a lull at the present time. I have sent 80 pamphlets, and if there is any fresh outbreak, I will try and visit Loring, twice a week.

Please send me 50 more pamphlets on "Rules for checking the spread of Contagious or Infectious Diseases."

I remain,
Yours respectfully,

WILLIAM R. WADE, M.D.

DUNCHURCH, PARRY SOUND DISTRICT, February 26th, 1889.

P. H. BRYCE, M.D.,
Secretary Provincial Board of Health,
 Toronto.

DEAR DOCTOR,—Since sending my report last week, I have had two new cases of diphtheria: Rachel Wylie, aged 17 years, living five miles south-east of Dunchurch, and Mina Moore, aged 13 years, living four miles south of Dunchurch; both cases I believe received the contagion from Mrs. Kelsie's store, which, as I stated in my last letter, was closed a week ago yesterday.

Both the new cases, as well as the older ones are progressing favorably.

I received a call last evening from Dr. Caughell, as he was returning from the north, where he has been working with Dr. Hodgetts. He stated that Dr. Hodgetts needs assistance badly, but agreed with me in thinking that it is necessary for me to remain here several weeks longer, in order to carry out the precautions necessary to prevent a further spread of the disease.

I have only a few cases, as you will see by my reports, but they are so widely separated, and the roads are in such a bad condition, that it requires nearly all my time to look after them properly.

I have secured a horse and cutter, and on Thursday or Friday, if my patients are in such a condition that I can leave them for a couple of days, I intend visiting Loring, thirty miles north, for the purpose of fumigating the houses where the disease has been located, and for giving any instructions that may be necessary in connection with the disease in that place.

I remain,
 Yours respectfully,

WM. R. WADE, M. D.

P. S.—I received to-day the fifty pamphlets on “Rules for preventing the spread of Contagious and Infectious Diseases.”

DUNCHURCH, PARRY SOUND DISTRICT, March 5th, 1889.

PETER H. BRYCE, M.D.,
Secretary Provincial Board of Health,
 Toronto.

DEAR DOCTOR,—Your letter of March 1st received to-day. I will not be able to send the diagram you require with this report to-morrow morning on account of the shortness of time in which to prepare it, but will send it by the next mail, which leaves here on Friday morning.

I have had one new case of diphtheria since sending my last report—Peter Porter, aged 28 years, residing about eight miles north of Dunchurch; he, I believe received the infection at McConkey (Loring).

All of my cases are doing well, the majority of them being convalescent.

On Friday last I went to McConkey, thirty miles north, and returned on Saturday; there are no cases of diphtheria there at present. All that is required at that place now is to disinfect the houses in which the disease has been located, and I intend visiting McConkey again next Friday for that purpose.

There have been seven deaths at McConkey from diphtheria—so the people state—but I did not obtain the names of all the deceased. Two of the patients who recovered are suffering from diphtheritic paralysis which I will treat on my next visit, since I did not have the necessary medicines with me last week.

I remain, respectfully yours,

W. R. WADE, M.D.

DUNCHURCH, PARRY SOUND DISTRICT, March 12th, 1889.

DR. PETER H. BRYCE,
Secretary Provincial Board of Health,
 Toronto.

DEAR DOCTOR,—Enclosed you will find a rough diagram of this district. It is not necessary for me to say that I am a poor hand at drawing as my diagram shows it. On account of the number of patients and the distances I had to drive to see them I was unable to send the sketch at the time I mentioned in my last letter.

Since sending my last report I am sorry to say I have had three fresh cases of diphtheria—George Crisp, aged seven years ; Wm. Crisp, aged ten years ; Alice McAllister, aged twelve years. The disease has not shown itself at Dunchurch since I came here, but breaks out in the surrounding settlements notwithstanding all my efforts to subdue it. George and Wm. Crisp live at Fairholme, seven miles south of Dunchurch, while Alice McAllister lives at Whitestone, eleven miles north-west of Dunchurch.

I have to report all my cases doing well, except Alice McAllister, who is in rather a critical condition, but I do not anticipate a fatal termination of her case.

I was unable to visit McConkey last week, but will endeavour to do so next week if I have no new cases in the meantime.

As you will see by my reports, I have not a large number of patients to attend but the distances I have to drive to see them, and the condition of the roads, take up so much of my time that I am busy from early morning till late at night, and I often find it necessary to use two different horses for one day's driving.

Awaiting any instructions you deem it necessary to give,

I remain, yours respectfully,

W. R. WADE, M.D.

DUNCHURCH, ONT., March 19th, 1889.

PETER H. BRYCE, M.D.,

Secretary Provincial Board of Health,

Toronto.

DEAR DOCTOR,—This week I have a more satisfactory report to send. I have had no new cases of diphtheria since sending my last report and my patients are all doing well, so well that after this week I do not think they will require medical attendance. By Saturday evening I will have fumigated thoroughly, I believe, all the houses in which the disease has been located, except that of Mr. Jonathan Crisp, Fairholme, and Mr. Leitch, Whitestone, where Alice McAllister has been confined. It would of course be too early to fumigate these two houses, but the people are very intelligent and agree to carry out my instructions minutely with reference to fumigation, disposal of bedding, etc., after I supply the required amount of sulphur, viz. three pounds for every thousand cubic feet of space.

On Sunday night I went to McConkey, reaching there at six o'clock Monday morning, and returned Monday night. The roads are in such a state that travelling by day is almost impossible owing to the heat of the sun thawing the snow, which is still very deep in some places, and allowing a horse to sink down, but the frosts at night renders the roads more passable. Between seven o'clock in the morning and eight o'clock at night I fumigated all the infected houses at McConkey.

The following are the names of those who died of diphtheria at McConkey :—Frances Robertson, aged three years ; John O'Reilly, aged twenty-four years ; Martha Curry, aged seven years ; Livinia Brooks, aged seventeen years ; Laura Gordon, aged two years ; Lizzie Forsyth, aged five years ; Lucy Forsyth, aged two years.

The school here at Dunchurch was opened on Monday last.

If no new cases appear I hope to be able to report at your office in person on Tuesday next.

I remain yours respectfully,

W. R. WADE, M.D.

DUNCHURCH, ONTARIO, March 25th, 1889.

PETER H. BRYCE, M.D.,

Secretary Provincial Board of Health,

Toronto.

DEAR DOCTOR,—Your letter of the 21st to hand on Saturday evening.

In my last report I stated that I thought of leaving for Toronto to-morrow, Tuesday, but would have been unable to do so even had I not received your letter as I have had two new cases of diphtheria since sending my report ; as it is I will now await a letter from you advising me as to the time you think proper for me to leave.

The two cases above mentioned are Frank Crisp, aged 3 years, and Mary Crisp, aged 15. Both of these are mild cases and I anticipate a speedy recovery. The reason that the disease has spread in the Crisp family, is that isolation was practically impossible on account of the small size of the house and absence of partitions in it.

I have fumigated all the houses where the disease has been except that of Mr. Leitch, Whitestone, and Mr. Crisp, Fairholme; Alice McAllister who was confined in Mr. Leitch's house has been up for over a week and I will see to the fumigation of that house before I leave. Mr. Crisp agrees to follow minutely my instructions with reference to fumigation, disposal of bedding etc., so that I think it safe for me to leave some time this week.

The above mentioned are the only cases of diphtheria in this district, and I believe there is no danger of a further spread of the disease.

Awaiting instructions from you,

I remain yours respectfully,

W. R. WADE, M.D.

In order that some permanent method for promoting and maintaining the health of these districts may be adopted, the Minister of the department introduced at the suggestion of the Board, the following Bill which became law.

AN ACT TO AMEND THE PUBLIC HEALTH ACT.

Her Majesty, by and with the advice and consent of the Legislative Assembly of the Province of Ontario, enacts as follows:—

1. Every Stipendiary Magistrate already appointed, or who may hereafter be appointed under the provisions of "The Unorganized Territory Act," shall be *ex-officio* a Medical Health Officer in and for the district for which he has been, or shall be, appointed, and shall possess all the powers of such an officer under the provisions of "The Public Health Act."

2. The Provincial Board of Health may also, subject to the approval of the Lieutenant-Governor-in Council, appoint in any of the unorganized districts one or more sanitary inspectors under "The Public Health Act," who shall possess the powers conferred upon sanitary inspectors under "The Public Health Act," and also all the powers conferred upon Local Boards of Health by section 14 of the said Act.

3. All constables appointed for any Provisional Judicial, Temporary Judicial or Territorial District under "The Act respecting Constables," chapter 82 of the Revised Statutes of Ontario 1887, shall be *ex-officio* sanitary inspectors with the same powers as sanitary inspectors appointed under this Act.

Upon the withdrawal of the Medical Inspectors, your secretary transmitted the following memorandum for the consideration of the Minister. What practical conclusions may be arrived at in the matter, cannot yet be stated as many points demand consideration; but it is hoped that the good beginning made will be continued.

The following is the memorandum:—

Hon. Mr. Gibson:

April 15th, 1889.

DEAR SIR,—I have the honour to bring to your notice the outline of a scheme which, if approved, will be the beginning of a systematic work which will be of great permanent benefit, both in saving of life and expense to the settlers of frontier districts; also, at once the solution of a difficult problem which has become more urgent from year to year.

I have had drawn up, and herewith attach for your inspection, a table showing (where obtainable) the municipal statistics of the population and annual expenditure in the four Districts of Muskoka, Parry Sound, Haliburton and Nipissing.

From it you will gather (1) the relative number of organised and unorganized townships; (2) the population (where obtainable) of the organized townships; (3) the amount of moneys annually expended in each and the rate per capita.

Summarized we learn that :

Muskoka.

Townships	22	
Made returns	14	
Villages	3	
Population, townships	9,995	
“ villages	3,661	
Total taxes of 14 townships	\$24,678	= 2.47 per capita.
“ 3 villages	15,514	= 4.24 “

Parry Sound.

Townships	44	
Organized	9	
Returns	9	
Villages	1	
Population, townships	4,961	
“ villages	1,329	
Total taxes of townships	\$14,988	= 3.02 per capita.
“ villages	5,186	= 3.90 “

Haliburton.

Townships	18	
Organized	9	
Made returns	9	
Population, townships	5,573	
Total expenditure of townships	\$20,364	= 3.65 per head.
Villages	None.	

Nipissing.

Townships	51	
Organized	6	
Returns	6	
Villages	1	
Population, townships	3,711	
“ villages	989	
Total taxes of townships	\$6,892	= 1.86 per head.
“ villages	2,191	= 2.22 “

This includes only the country south of Lake Nipissing and the Ottawa River, and for the present I shall limit my study to this district.

	Population.		Population of townships.
Muskoka	13,656	or	9,995 = 14 townships.
Parry Sound	6,290	“	4,961 = 9 “
Haliburton	5,573	“	5,573 = 9 “
Nipissing	4,700	“	3,711 = 6 “
	<hr/> 30,219		<hr/> 24,240 38

Leaving out the villages in the calculation we have 38 townships each 9 miles square, occupying with the 97 unorganized, roughly, 12 townships north and south by 12 east and west or about 108 miles square. As will be noticed by a glance at the

accompanying map, the organized and unorganized townships are not in any particular part of a district, and it would be wholly wrong to assume that the unorganized have no populations, since we have learned that many of the latter have populations equal to those of the former. From information gained through various sources, we estimate the population of the unorganized townships at probably half that of the organized. This would give us, roughly, a population over the districts of 24,000 in organized, and 30,000 in unorganized. But allowing for errors and assuming 50,000 of a population, we then have a population of 50,000 distributed over, say, 108 miles square or over 11,664 square miles.

It will be practically correct to say that we have five persons for every square mile of the whole district or one family of five. This is at the rate of about 400 of a population to each township. Comparing this with an old county with townships having about the same area as, say, the County of Ontario, and we find a population of nearly 3,000 per township in the latter. In the nine organized townships of Parry Sound of about the same area as Ontario County, the value of real property is assessed at about \$822,347, while the latter has an assessed value of \$15,792,740. Hence with a population seven times as great, and a wealth per township twenty times as great, the per capita municipal expenditure in Ontario County is only \$3.63, while that in Parry Sound is \$3.02, or an average total per township of \$1,600 to be expended for all purposes. The real property assessed in Parry Sound District has an assessed value equal to \$165 per capita.

This latter fact illustrates the next point to be referred to viz., the necessarily poor character of the houses. Shanties of one room frequently are the abode of families of five or more members.

The reports of our physicians have, if more than a statement of the fact were needed, illustrated the difficulties of treating contagious diseases under such circumstances. Every susceptible person must inevitably become a victim of the disease, and general reports in addition to those of the above relate, unfortunately too well, the enormous percentage of deaths as compared with treatment under poor conditions.

Another point which presses for prompt consideration is the fact that some thousands of lumbermen and river-men are annually engaged in these districts, and that when they become ill (and the crowded shanties in several districts have become *foci* of diphtheria) the absence of medical aid demands that the sick, for the safety of the others, be sent away. They go to the nearest settlement (as I have multiplied evidence causing me to know), from house to house, and from public conveyance, as stage, rail-car, etc., infecting here and there persons and so spreading the disease, as has been done within three or four years from one end of this district to the other.

The sparsity of population, the broken roads, and the poverty of the settlers (as our figures show) result in a scarcity of physicians to a degree which makes attendance upon diphtheria cases at far off distances almost impossible, since they require prompt attention with careful and intelligent nursing under favourable conditions, and none of these usually are available.

The points at which physicians have settled are mostly along the two railways running north and south, the Northern extension, and the Victoria Railroad north from Lindsay.

There are five colonization roads in the district, the Parry Sound, the Rosseau and Nipissing, the Victoria, the Hastings Road, and the Ottawa and Opeonga, and to cover these 10,000 square miles we have physicians at :—

HALIBURTON DISTRICT.

Dr. Frost, Kimoont,

| Dr. Curry, Minden.

MUSKOKA DISTRICT.

Dr. Bridgland, Bracebridge,
Dr. Williams, Gravenhurst.

| Dr. Hart, Huntsville.

 PARRY SOUND DISTRICT.

Dr. Toole, Sundridge,
 Dr. Walton, Magnetawan,
 Dr. Applebe, Parry Sound,
 Dr. Walton, Parry Sound,

Dr. Porter, Powassan,
 Dr. Robbins, Burk's Falls,
 Dr. Caughall, Burk's Falls,
 Dr. Holmes, McKellar.

NIPISSING DISTRICT.

Dr. Deebe, Sturgeon's Falls,
 Dr. Carruthers, North Bay,

Dr. Benoit, Mattawa,
 Dr. Earle, Mattawa.

Manifestly, therefore, we have need to lend aid in those districts where none such are, and, since the people are so poor and the population, from successive years' statistics, does not seem to be increasing, where none are likely to settle.

Without discussing the value of the services which an occasional physician sent into a district may perform, I think I may say that such temporary services are both expensive and unsatisfactory. Adopting the plan of bonusing physicians for working in a district would, I submit, be an ill-advised measure, unsatisfactory in results, and would cause an increasing and endless amount of trouble.

There is remaining to us for adoption the system which is practised in our cities and towns for the treatment of indigents, and for those persons suffering from contagious diseases, who, as the law provides, are taken to isolation wards of hospitals when they are likely to become dangerous to the health of the community.

I need not quote statistics, which are abundant on this point, but I need only indicate the positive advantages which the establishment of such hospitals at central points would have.

1st. They can be constructed at small cost. One at St. Catharines, of ample size, did not exceed in cost \$750. Such would probably be cheaper in the north.

2nd. They would be open to patients from the whole district, who for a nominal weekly fee would be supplied with wholesome food, lodgings and medical attendance, while the work of a physician would be concentrated and his results satisfactory. To illustrate the latter I may point out that when in 1888, at the Penetanguishene Reformatory, 65 boys out of 200 became affected with diphtheria there was not one death, while in the three houses of the attendants, into which the disease was carried, there were two deaths.

3rd. First cases of infectious disease would be brought there. If a child, then its mother would come too, and be carefully attended, their houses being saved from becoming centres of the disease and sources of infection.

4th. The men from the shanties and river-drives would have a place to go to for treatment, and the charges could be made upon the companies who, like railway companies, would collect a per capita tax from the men.

5th. The stipendiary magistrates would by such means be enabled as health officers to enforce isolation more efficiently by sending the sick to these houses of recovery, and have good grounds for punishing persons who wilfully might expose others to infection.

6th. Thus persons would, from knowledge gained in these hospitals, learn something of the nature of disease, and how to prevent it.

7th. By a grant not exceeding that given to our smaller hospitals at present, as Mattawa, etc., small hospitals could be carried on, while the adoption of the principle would ensure, at least in the Dunchurch District of Parry Sound, that Dr. Wade, who has given satisfactory service, settle there as a practitioner, if the amount of \$500 be granted for the maintenance of a small hospital.

8th. There is but little doubt that it will be possible to get young physicians to locate in other centres if similar provision be made for the establishment of hospitals in them.

9th. This amount expended would not exceed the amount paid to a single physician for two months' work if we include in it salary, all expenses, medicines, etc.

The provision for such grant exists under chapter 248, R.S.O. *re* Aid to Charitable Institutions.

As it is very desirable that early action be taken, in order to secure Dr. Wade's services for Dunchurch, as he will within a few weeks decide on his future field for practice, I shall feel greatly obliged if you will appoint an hour for discussing this matter with Mr. Christie, Inspector of Public Institutions, and myself, and shall be glad if he be invited to be present.

I have the honour to be,
Your obedient servant,

PETER H. BRYCE,
Secretary.

The report was adopted.

3. Anthrax.—The following correspondence shows the nature and persistency of this disease which has obtained a firm hold, as appears in the Guelph district. In close connection therewith, and owing to the fact, as illustrated in one of the letters, that hides were taken from the dead animals and sold secretly, the animals being buried without proper supervision, is printed a letter from a prominent Guelph physician drawing attention to the dangers which may most readily result from the use of impure wool in mattresses. Should such waste come from factories where wool infected with anthrax or other infectious disease had existed, or from the shoddy mills where infected cloth had been used, it is by no means an improbable case that should disinfection be neglected, most serious results would follow. Unless an expert were appointed under the Board or under the Factories Act to carefully enquire into these matters, we fail to see how the dangers from such sources are to be obviated.

GUELPH, 2nd June, 1888.

DR. P. H. BRYCE,
Toronto.

DEAR SIR,—The Guelph township Board of Health met again to-day. Four new cases of anthrax have occurred—all directly traceable, my father thinks, to animals buried last year or before. He wishes to ask, can anything be done to disinfect the ground? One of the losers is very anxious to try inoculation if proper virus can be obtained. Can this be done? Would your Board of Health for the Province do anything in the matter? Mr. Parsons and Mr. Dawson are again the losers. The animals have not been burned as far as I can learn.

Yours truly,

D. McCRAE.

(Transferred to this Department.)

GUELPH, 6th September, 1888.

HON. CHAS. DRURY,
Department of Agriculture, Toronto.

DEAR SIR,—You spoke to me about the imported Southdown ram. He died on the farm. My father remembers the circumstance.

Anthrax has been bad again. I heard last night about two cows belonging to people in town that died lately—believed to be from anthrax. They had been pasturing on the flats where it seems to be epidemic. When they died they were given to some one who dragged them away for their hides. I doubt if any present law will allow this to be prevented. If there is please let me know about it. I have looked over the Health Act, but to me it does not seem clear.

Yours truly,

D. McCRAE.

GUELPH, 10th September, 1888.

DR. P. H. BRYCE,
Toronto.

DEAR SIR,—Since writing you *re* removal of animals dying from anthrax, I have seen Capt. Clark. He informs me that he had the carcasses removed by lorry to the refuse ground and buried in the heaps of manure, being made, I presume, for sale. This did not commend itself to me as quite satisfactory, though Capt. Clark was quite sure it was all right.

I do not share your views as to the powers of the Board of Health in this matter. These last were in the city and, therefore, under the health officers here.

Yours truly,

D. McCRAE.

GUELPH, October 22nd, 1888.

DEAR SIR,—I send herewith a sample of the wool batting found in a mattress direct from the manufacturer's hand. I am informed that all the upholsterers use it in making up mattresses, excepting those of curled hair, which are very expensive. On inspection you will see that it is really a collection of the dirty odds and ends about the floor of a woollen factory (including the sweepings). It has a musty, offensive smell, and cannot but have a most pernicious effect on the health of the unfortunate people who have to sleep on such a bed. It taints even the air of the room, and I am not sure that it may not often enough be the hidden cause of some of the diphtheria that we meet with.

The existing laws require medical men to report every case of diphtheria, yet the manufacturer for his own gain is allowed to fill a mattress with refuse, and send it, with all its germs of filth, to be slept upon by unsuspecting people. This infernal greed for *filthy lucre* will stop at nothing unless exposed. Will you kindly look into the matter? Probably it will be found that all made up furniture is stuffed with something of no better origin or quality.

Could not the Provincial Board of Health bring such pressure on the Government as to have an inspector appointed wherever such manufactories exist? Let such inspector go armed with power to prevent all such abominable outrages upon the health of the unsuspecting public.

With kind regards, I am,

Very sincerely yours,

The following is the reply of the Sanitary Inspector, Guelph, to a request of Dr. Bryce to supply the latter with any facts regarding animals that died during the past summer :—

“With regard to the information you ask for, I do not know whether the animals died from the disease called anthrax or not, and I am unable to find out from the parties who owned these animals what was the cause of death. The information which I received was as follows :—

Case I.—Thomas Simpson, butcher, states that his beast was turned out on the flats in the morning, and at night when it came home he noticed that the animal would neither eat nor drink anything and he put it in the stable for the night, and the next morning it died. He had it skinned and sold the hide to Mr. Stull, a man who follows that business on the Guelph market. The carcass was taken to the nuisance ground and buried by the nuisance contractor.

Case II.—Mr. T. Ellis, butcher, states that his beast died on the flats. It was quite well in the morning when he put it there at 8 o'clock, and at 11 o'clock, a.m., it died. He skinned it and sold the hide and buried the carcass four feet deep in the ground.

Case III.—Mr. Gibson states that his cow was grazing on the same flats as the others and she was brought home in the morning, milked, and fed, and afterwards it was turned into another field close to the house. He did not notice anything the matter with it then, but it broke out of this field and got to the flats again, and he saw it go direct to the river and drink freely, after which it came back amongst the other cattle; this was about 12, noon, and at 2 p.m. it was found dead. It was skinned, hide sold, and carcass buried.

Case IV.—Mrs. Olson states that her cow died under similar circumstances as that of Mr. Gibson's, only that her's was brought home at night; but she noticed that the cow was sick and would not give any milk. The cow was kept in the stable and was attended by a veterinary surgeon, and was sick three days before she died. She was skinned, hide sold, and carcass buried.

Case V.—Mrs. Brisbane states that this year she lost two fat pigs, and last year she lost 12 pigs, 1 cow, and 1 horse, all on the same flats. The two that died this year were noticed to be rooting up the ground on the same spot where Mr. W. F. Stone buried one of his cattle last year which died from the same cause as the others, and these pigs died two days after they had been rooting up this spot. They were buried three feet under ground.

Case VI.—Mrs. McShane states that she lost one cow and that it was grazing on the same ground as the others. The cow was brought home at night and would not give any milk. She put her into the stable and the next morning she was found dead. It was skinned, hide sold, and carcass buried.

This is the number that have died this year, and this is about all the information that I can give you. There are a great many opinions about this matter; some are inclined to think that the river has something to do with it, while others hold different opinions, but a good many would like if you could come up and meet all those gentlemen who are interested in this matter, and those who own the ground where this disease is supposed to be, and talk the matter over and find out what is best to be done.

Regarding the means for stamping out anthrax in the Guelph district little more can be added to that printed in the report for 1887. If the pastures are to be used for grazing then inoculation would seem to be the sole prophylactic measure. Proper disinfection of animals dying in future may be insured, and it ought to be possible, in large measure, to protect animals against inoculation from grazing over the places where animals have been buried. The question of who is to deal with the matter seems as yet, however, not to be settled, and we await some avenue by which active steps in the matter may be taken.

II.—NOTIFICATION OF INFECTIOUS DISEASES.

It would be improper to leave the subject of outbreaks of disease without referring to notification of disease. Notification in its operation has three points for consideration, (a) notification by the physician and householder; (b) notification by local boards and their officers of Provincial Board, and (c) notification by the Provincial Board of contiguous Provincial and State Boards.

Regarding the first, fortunately the law in Ontario is very precise and exact in its terms, and supplies a ready means by which local authorities and their officers can become acquainted with the prevalence of dangerous disease in their midst. As we are well aware the growth of the principle in England and elsewhere has not been rapid, but the past few years have seen decided advances, until now there are fifty-six urban sanitary districts in which notification is compulsory, and we are able to obtain therefrom a complete monthly history of disease amongst some four and a half millions of people. While the adoption of the principle has been voluntary there for these districts, the systematic way in which the law is carried out is, in some degree, at variance with experience in America, but especially to that in those cities of the Union where the law is enforced, and to some extent in urban municipalities in Ontario. Yet in these latter yearly advances have been made, and many towns can congratulate themselves on a notification which is tolerably complete. The chief defect here, as perhaps elsewhere, is that most of the Medical Health Officers are practitioners, and a sometimes reasonable objection is made that such an officer is legally in a position to injure a fellow practitioner. The obvious remedy here is that such officer have his whole time devoted to public health duties; but as this will be, in many places, little likely to take place for some years yet, the difficulty is readily, and indeed, in many cases even now, practically overcome by the officer assigning to the Sanitary Inspector the duty of enquiring into the sanitary conditions and the

isolation of houses, and leaving the execution of details largely in the hands of this officer. Perhaps, however, the greatest and more reasonable excuse for non-notification in Ontario by physicians is the knowledge that defective measures exist for isolation, inspection and disinfection in those instances where notification is made. There must, in order that such notification be of value for statistical, or indeed for any purpose, be an organized sanitary corps so equipped that they practically relieve the attending physician of the work of isolation and disinfection. Such is done in England and in some other places, with the result that in those towns where notification is compulsory, most marked diminution in the mortality has already taken place. The primary advantage of the method is that it supplies a ready means whereby the poorer and improvident classes in the community may receive medical attendance and nursing by their removal to an isolation hospital, and further be prevented from becoming a menace to the public health by spreading the disease.

To illustrate the results of isolation, comparative statistics were given of individual places in our report for 1887, but the following from the returns for forty-five urban sanitary districts in England and Scotland for the month of February, 1889, is equally significant:—The annual mortality from all causes in these towns averaged 17.0 per 1000. This death-rate is 2.6 per 1000 below the mean rate last month in the twenty-eight large English towns dealt with by the Registrar-General in his weekly return, which was 19.6 per 1000. The death-rate from the eight infectious diseases dealt with averaged 0.7 per 1000, and showed a decline from the rates of the previous three months. These figures are most instructive, and present a marked contrast with many American cities of a very much less average population. There is one other marked defect, apart from imperfect notification, which Local Boards in America must remedy before great improvement in results can be expected, which is in the period of time a patient who has had the disease must remain isolated before mingling with persons susceptible to the disease from which he has suffered. With regard to several diseases, notably smallpox, there is but little difficulty, but in the instance of mild scarlatina, measles, and mild forms of diphtheria, physicians, but especially patients, are greatly inclined to allow the sick to mingle with the well as soon as the more acute symptoms of the disease have passed off. There is no more constant cause of dispute between Local Boards and those in charge of the patient than this, and no one cause of appeal to your Secretary *re* the powers of a Local Board more common than it. The evil is far-reaching and has most serious effects upon the prevalence of disease. Through it the work of disinfection, too often of a perfunctory character, is carried out before the stage of infectiveness of the skin and mucous membranes of a patient have passed. This done the person is allowed to be present in all other parts of the house as well as the sick room, and mingle with other members and see callers; and further, in many instances, goes to school, church and public places, and so carries the infection to others who are susceptible. It is at once readily conceded that it is often inconvenient, and in some instances a hardship, especially where the sick is a wage earner, for persons to be isolated for the time necessary for the safety of others; and oftener still harder for other members of a family to be under surveillance or quarantine on their account. But in all such cases, not only is the public safety the only question which can be considered, but it also may be said that when the alternative of having the patient removed at once to an isolation hospital is offered, not only is such isolation reasonable, but it ought to be rigorously maintained, since thereby it will be one of the first means by which the public will be taught that it is for the individual benefit, the family safety and economy and the public good that such patients be removed at the earliest moment to some house of recovery. Says Dr. George Buchanan, Medical Officer Local Government Board of Great Britain, in his last general memorandum, (April, 1888), "On the Proceedings which are advisable in places attacked or threatened by Epidemic Disease."

"11. All reasonable care should be taken not to allow infectious disease to spread by the unnecessary association of such with healthy persons. This care is requisite not only with regard to the sick-house, but likewise with regard to schools and other establishments wherein members of many different households are accustomed to meet.

"12. If disease begins in houses where the sick person cannot be properly accommodated and tended, medical advice should be taken as to the propriety of removing him to an infirmary or hospital. *Every sanitary authority should have in readiness a hospital for the reception of such cases.*"

"17. Provision by the public authority for disinfection by heat of bulky articles, and of those which cannot without injury be exposed to chemical agencies, ought always to be in readiness. Without such no complete disinfection can be effected. Partial and nominal disinfection, besides being wasteful, may be mischievous as giving rise to a false security."

So important is the isolation hospital becoming in the eyes of English sanitary authorities, in view of its effectiveness in preventing epidemics, that Dr. Buchanan has, in his report for 1888, further issued a memorandum in which diagrams and plans are set forth. In view of the frequent references which have been made by your Committee on Epidemics during the past year to this matter, I have taken advantage of Dr. Buchanan's memorandum to abstract a few remarks from it, and to give diagrams of plans of hospitals constructed for the special purpose of isolation.

Says Dr. Buchanan, "English communities nowadays recognize the advantage of isolation hospitals as a means of preventing the spread of infectious diseases from persons who cannot be properly isolated in their own homes. It cannot be too clearly understood that an isolation hospital, to fulfil its proper purpose of sanitary defence, ought to be in readiness beforehand. . . . Thus hospitals provided during an epidemic are mainly of advantage to particular patients; they have little effect in staying the further spread of infection."

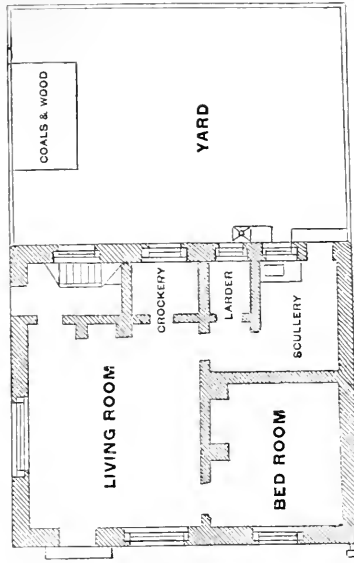
This memorandum also suggests to sanitary authorities of rural districts and of small towns the means by which they may most advantageously make such provision. "The permanent provision to be made in a town should consist of not less than four-rooms in two separate pairs; each pair to receive the sufferers from an infectious disease, men and women of course separately. See page 200.

"Plans illustrating the sanitary requirements of small hospitals for infectious disease, are arranged on three sheets accompanying the present memorandum. Plan A, on the first sheet, is that of a little building to hold two patients of each sex. On the second sheet a plan and a section (B) of a rather larger hospital building are shown, providing for six patients, with separation of sex, and also of one infectious disease from another. The third sheet shows (plan C) a small pavilion adapted to receive six male and six female patients suffering under one kind of infectious disease. On the same sheet is placed a plan (D) of a ward block for ten patients, of similar design to plan B, and a convenient disposition of buildings upon site is also indicated. It will be found that in all the plans proper standards of space are observed, viz., not less than 2,000 cubic feet of air space, than 144 square feet of floor space, and twelve linear feet of wall space to each bed; that means are provided for the adequate ventilation and warming of wards, and for securing them from closet emanations and the like. In plan A, earth closets, in other plans, water closets, are indicated as the means of excrement disposal. The latter are to be regarded as preferable where efficient sewers are available. Places for washing and disinfection, and for a mortuary are indicated. It will be observed that an interval of forty feet is everywhere interposed between every building used for the reception of infected persons or things and the boundary of the hospital site. This boundary should have a close fence of sufficient height, and the forty feet of interval should not afterwards be encroached on by any temporary building or other extension of the hospital. In the construction and arrangement of such temporary buildings as may at times be wanted in extension of the permanent hospital, the same principles should be held in view.

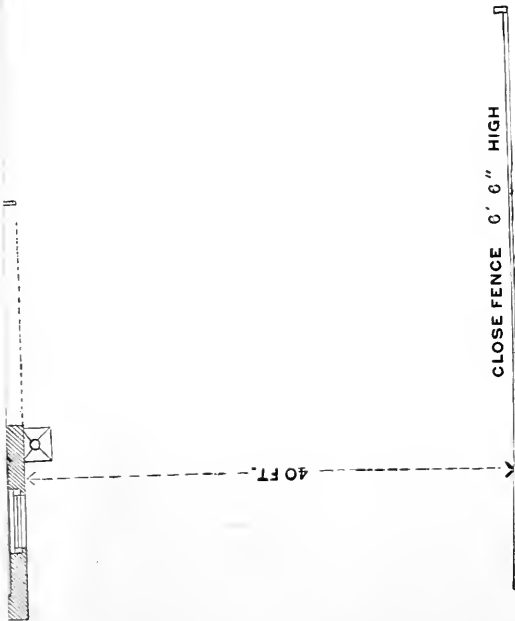
In determining the locality where an infectious hospital should be placed, the wholesomeness of the site, the character of the approaches, together with the facilities for water supply and for slop and refuse removal, are matters of primary importance."

Herewith I also give a diagram of a hospital constructed within the present year in the town of St. Thomas, in view of the threatened appearance there of smallpox.

PLAN A.

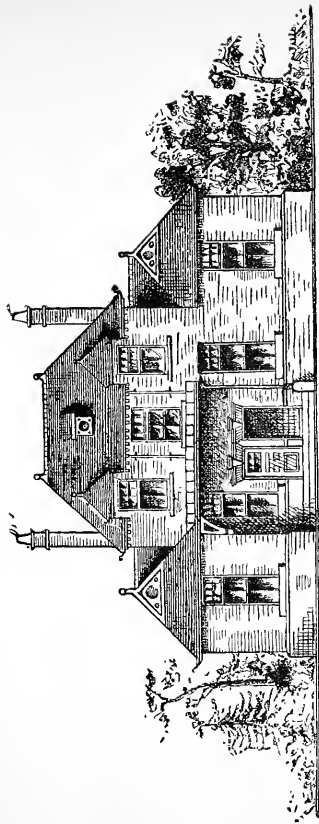


Scale, 16 feet to an inch.

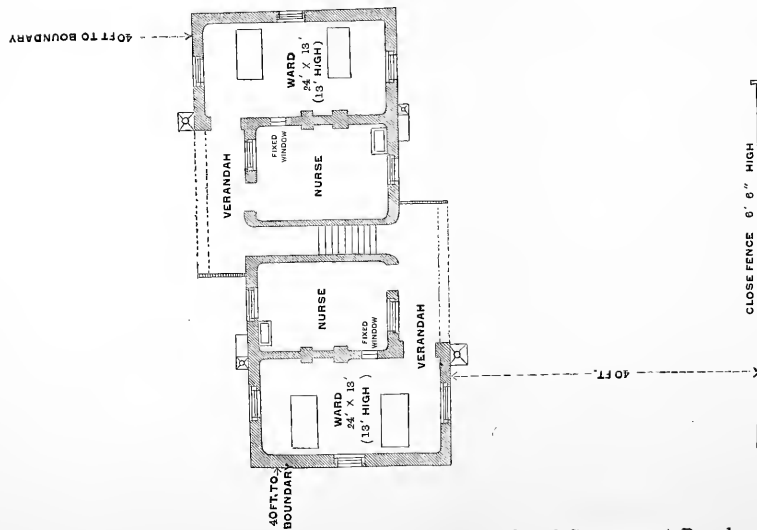


PLAN.

Local Government Board,
Whitehall, S.W.
February, 1888.



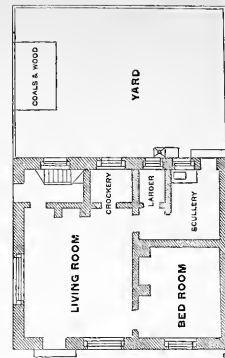
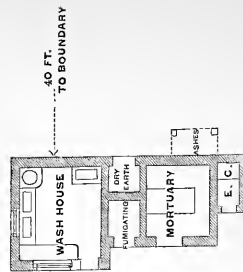
ELEVATION.



PLAN.

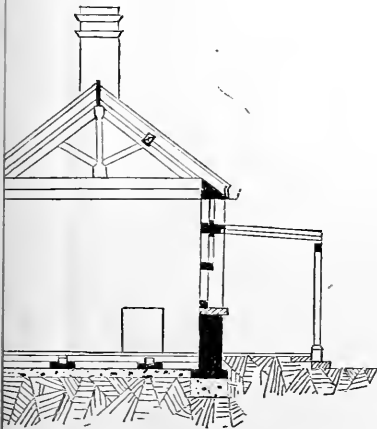
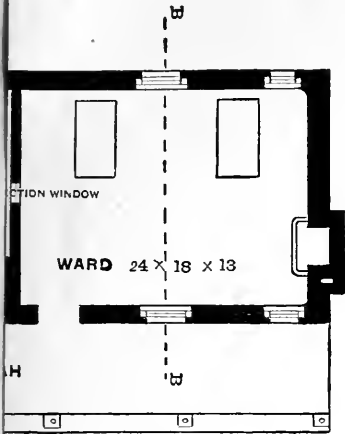
Scale, 16 feet to an inch.

N.B. Monable baths and Earth Commodes will be required for the wards. Where nurses' bedrooms are not provided in the caretaker's cottage, they may be placed in an upper storey of the ward-block as shown in the elevation.



PLAN A.

PLAN B.



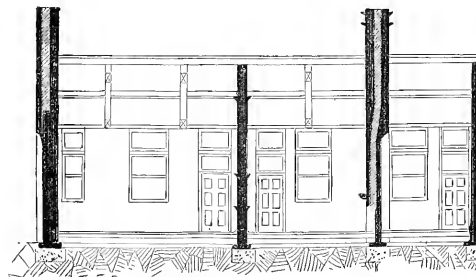
SECTION ON LINE B. B.

PLAN OF A BLOCK FOR SIX BEDS.

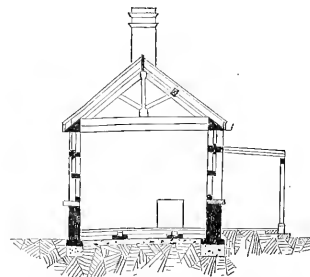
The plan shows a symmetrical layout with two wings. Each wing contains a ward (24 x 18 x 13), a nurses duty room, and a ward (12 x 18). The plan includes verandahs, inspection windows, and a central corridor with a sink and W.C. at each end.

Labels on the plan include: VERANDAH, WARD 24 x 18 x 13, NURSES DUTY ROOM, WARD 12 x 18, FIXED INSPECTION WINDOW, DWARDY PARTITION 6' 6" HIGH AND 6" OFF THE FLOOR, W.C., SINK, and A.

PLAN OF A BLOCK FOR SIX BEDS.



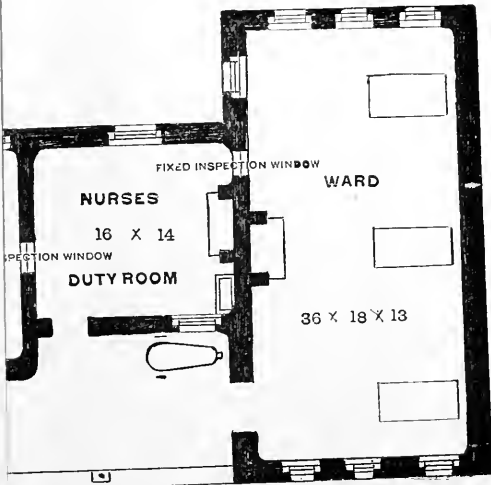
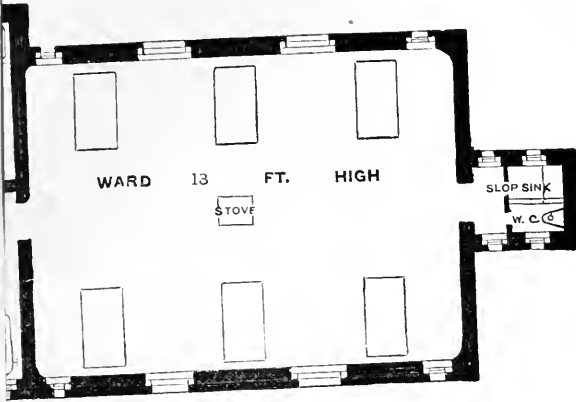
SECTION ON LINE A. A.



SECTION ON LINE B. B.

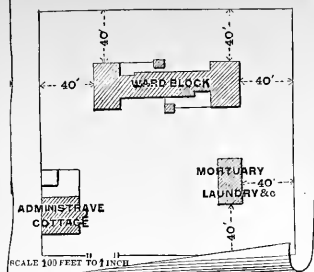
PLAN C.

ON FOR 12 BEDS.

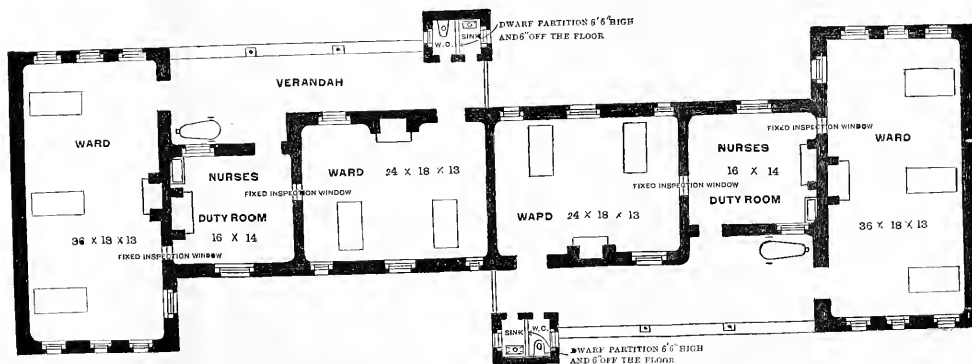
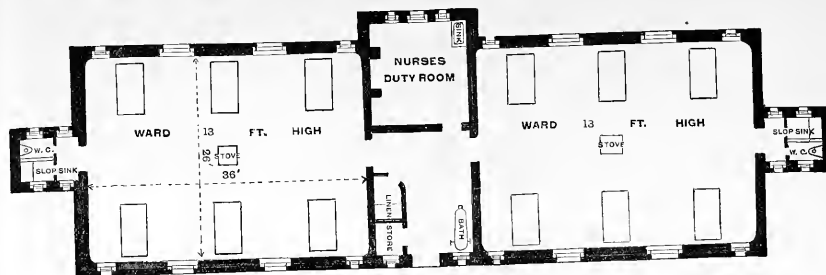


5' HIGH
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PLAN D.



PLAN OF A WARD PAVILION FOR 12 BEDS.



PLAN OF A BLOCK FOR TEN BEDS.

Scale, 16 feet to an inch.

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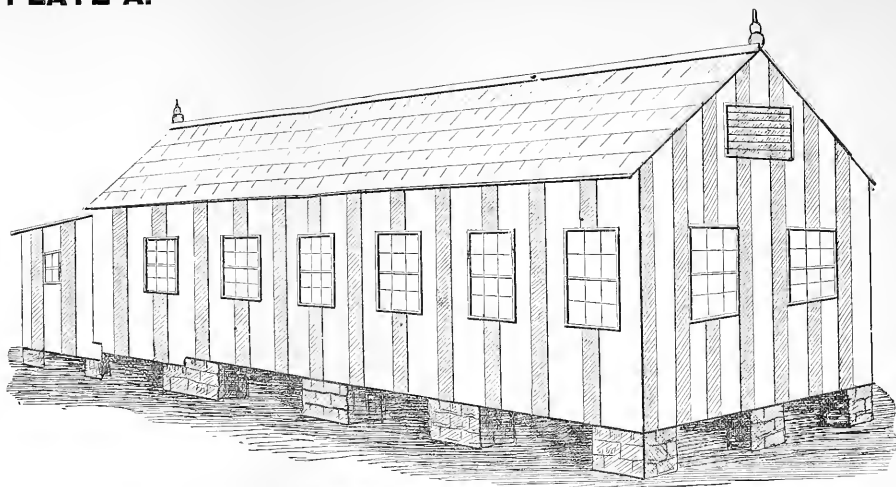
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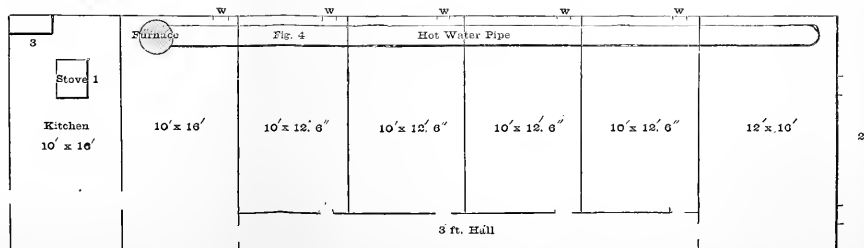
PLATE A.



ISOLATION HOSPITAL.

ERECTED BY ST. THOMAS LOCAL BOARD, MARCH, 1889.

PLATE B.



CROSS SECTION OF GROUND FLOOR OF ISOLATION HOSPITAL.

Size of building 16x73 feet; height of ceiling 11 feet; ventilator in gable ends, and regular ventilators in every room in ceiling; kitchen painted, and other rooms and hall twice oiled—all close-sheeted inside and hand smoothed. Fig. 1 is cooking stove. Fig. 2 is a Baker furnace—combination of hot water and steam. Fig. 3 is a cupboard. Fig. 4 is the heating pipe, alongside of wall the length of building. The cost of building, including stove and heater, would be \$905.

Regarding the purposes of such hospitals it may not be improper to refer to their rise, in times past, as fever hospitals, and that with years their use has extended to other forms of infectious disease. So important has become their use that through them largely the fever, typhus, for which they were primarily constructed, has almost disappeared from England. It has not been unnatural that since then their use has been given largely to typhoid, a disease, however, which under ordinary conditions in Ontario can, as far as the public are concerned, be treated readily in private houses. There are, however, instances, as when strangers and others are stricken with disease in houses where the sanitary conditions or the surroundings are bad, in which such are of the greatest value, not alone to the sick, but to the public. We have not infrequently found that neglect on the part of the physician to give directions, or oftener on the part of the nurse to perform, to disinfect the room, the bed and body linen, and the passages from the bowels have become the direct source of infection to other members of the house. Suffice it to say that this scheduled disease being directly under the supervision of the Medical Health Officer, there can be no reason why such authorities should not frequently avail themselves of the presence of an isolation hospital.

Not a few of our larger towns and cities have been moving in the direction of having hospitals built, which, if not specially designed for infectious diseases, are at least constructed with one or more wards so cut off as to make them of service in the treatment of infectious diseases.

Of these we may mention the following:

GUELPH, May 21st.

DEAR DOCTOR.—In the General Hospital there are two wards for the reception of contagious diseases. They are completely isolated from the rest of the building. There is also a small building some distance away which is used for the same purpose—or in cases of smallpox. At St. Joseph's Hospital they have a small building for contagious disease not connected with the main building. As a rule patients suffering from diphtheria, when proper rooms are not to be had at their homes, are sent to the hospitals. In cases of diphtheria they usually remain for about three weeks after recovery.

Yours sincerely,

THOS. H. KEATING,
Medical Health Officer.

OFFICE OF THE MEDICAL HEALTH OFFICER,
LONDON, ONT., May 17th, 1889.

DEAR DOCTOR,—I am in receipt of yours of 9th inst. 1st. There are no cottages for the reception of contagious diseases in connection with our city hospital. They are admitted reluctantly into one of the wards.

2nd. No rules of management exist between the local board of health and the hospital trustees with regard to admissions or the number of days from the onset of disease until dismissed from hospital; that is left to the discretion of attending physicians. I hope our hospital trustees will before long see the necessity of building isolated cottages or wards for the reception of infectious diseases, and not subject the inmates of the hospital to needless danger.

Yours truly,

T. V. HUTCHINSON.

P. H. BRUCE, M.A., M.D.,
Toronto.

CITY HOSPITAL,
HAMILTON, May 17th, 1889.

DEAR DOCTOR,—Our scarlet fever cases remain at least six weeks; measles, two, and diphtheria from three to twelve. They are in a building by themselves.

Smallpox is in a separate building, a mile from the infectious building of the city hospital.

Diphtheria patients are taken to the general ward after four weeks if they can safely be moved.

The nurses on duty in the infectious building have no duties elsewhere.

Yours very truly,

F. BEEMER

DR. RYALL,
City Health Officer.

MEDICAL HEALTH OFFICE,
LOCAL BOARD OF HEALTH,
HAMILTON, ONT., 13th May, 1889.

DEAR DOCTOR,—I enclose communication from the resident physician of our city hospital. Of course, you knew that the smallpox hospital is distinct and far away from the general hospital.

With regard to the time which should elapse after contagious diseases before patients should be allowed to mingle with the public you should settle that period for general adoption, and expert testimony would be most reliable to act on.

Scarlatina, of course, is not free from contagion until desquamation of the cuticle is complete—is there a particular time for that process to be accomplished? Many of the cases of so-called scarlatina have had no desquamation, and some of them no sore throat.

Croup gives a loop-hole for the non-reporting of diphtheria—when you find death from croup followed by a case of diphtheria in the same house, it looks exceedingly suspicious. Inflammatory croup is generally supposed to be a non-specific affection—but errors in diagnosis are not impossible. The chairman of the Board of Health desires me to inform you that the Board had a person up before the magistrate for breach of the health by-law, but that the magistrate did not support the health officer. The case was for the emptying of a privy vault not being done according to orders of the Board. The magistrate on former occasions has fined parties as high as \$10 for the same act.

Yours, etc.,

J. RYALL,
M. H. O.

DR. BRYCE,
Toronto.

MEDICAL HEALTH OFFICE,
LOCAL BOARD OF HEALTH,
HAMILTON, ONT., 13th May, 1889.

DEAR DOCTOR,—There is only one ward for contagious diseases in our hospital grounds. I have never been inside of it—all cases sent to the hospital are no longer under the control of the Board of Health. The resident medical officer discharges such patients when he thinks fit to do so: this has been the rule carried out as far as I know. I will inquire further from the resident surgeon, Dr. Beemer.

Yours, etc.,

J. RYALL.

I could not very well, from my own experience, give any stated time with regard to how long isolation should be maintained in the diseases mentioned. I think that some authorities go as far as seven weeks. The disease may subside in a very short time and the patient convalesce. During the latter period is there not danger? Some patients get rapidly well, others do not.

J. R.

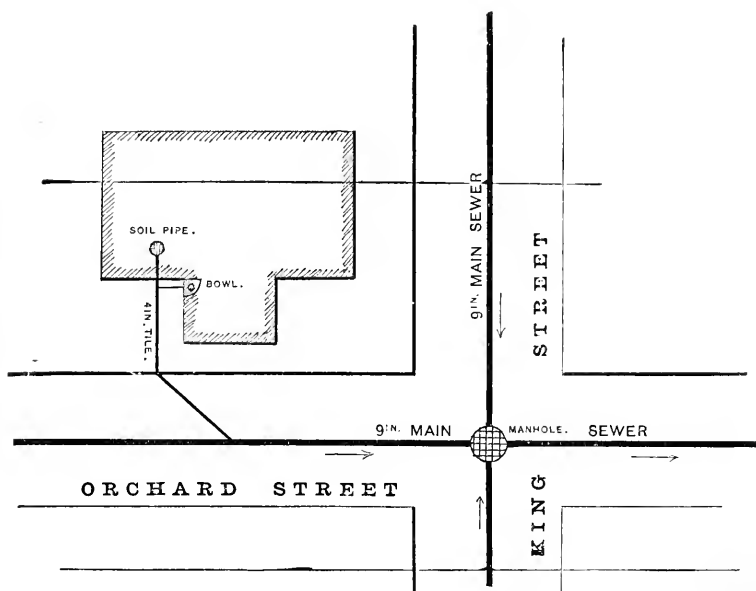
HEALTH OFFICE, CITY HALL,
OTTAWA, May 10th, 1889.

P. H. BRYCE, M.D.

DEAR DOCTOR,—In answer to your note of 9th inst, I beg to say that there are in this city two hospitals specially maintained for the reception and care of contagious diseases. One is annexed to the Protestant General Hospital, the other to the Roman Catholic General Hospital. They each receive from the Corporation the sum of eight hundred dollars annually, as a grant. They are under my special supervision, and with very few exceptions I attend to all cases there isolated. No case is discharged unless

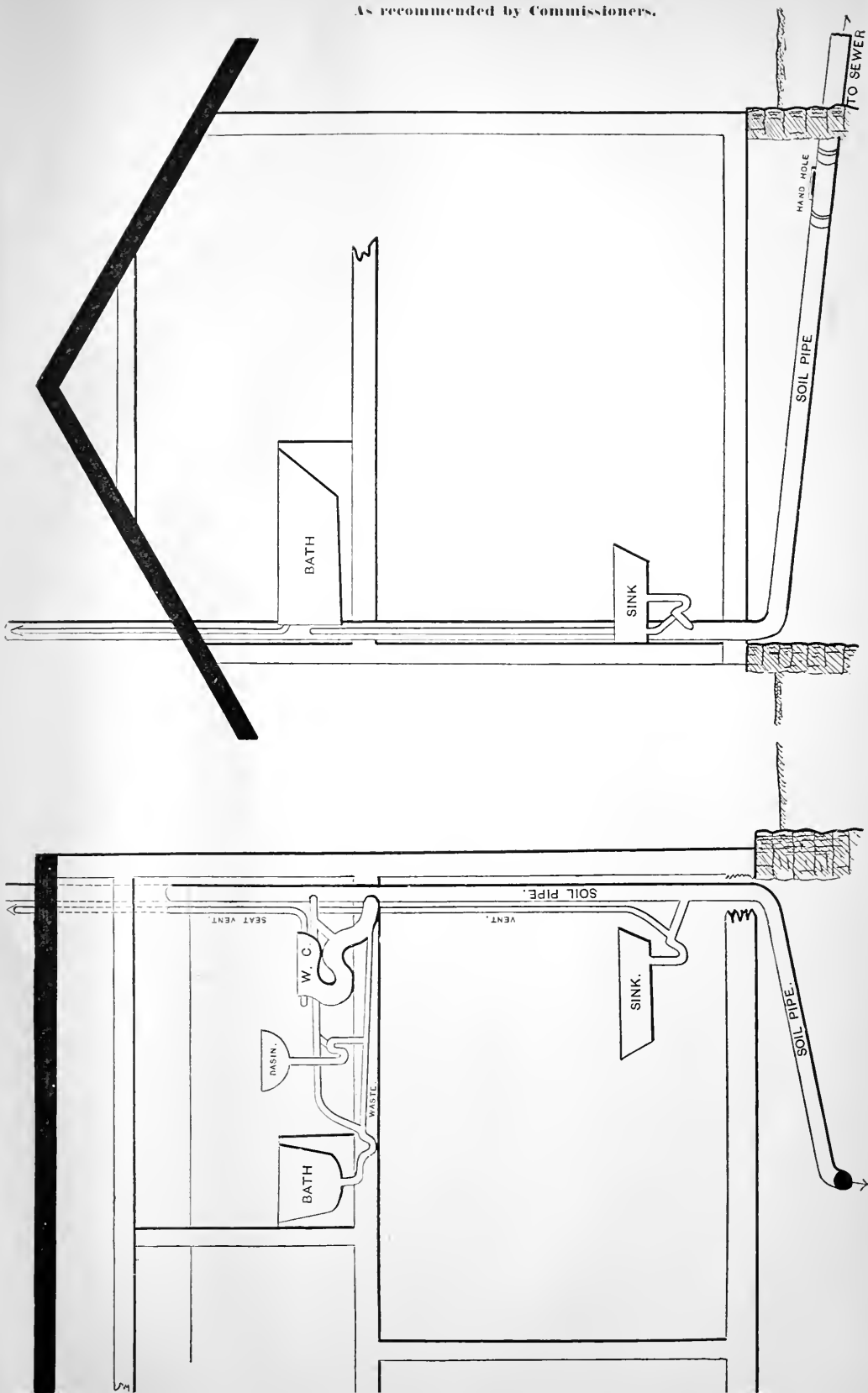
PLAN SUBMITTED ON APPLICATION

Under Form IV.



PLAN OF BROCKVILLE PLUMBING

As recommended by Commissioners.



with the consent and approval of the medical attendant. From the onset of the disease isolation would be enforced from three to six weeks, differing as you are aware, in different contagious diseases and also in different degrees of severity of the same diseases in different cases, the average duration of isolation being about twenty-five days.

Yours truly,

A. ROBILLARD,
M. H. O.

ST. THOMAS, ONT., May 10th, 1889.

DEAR DOCTOR,—Yours of the 9th instant received this morning. Regarding the information required I can only say we have no hospital in the city, with the exception of the one erected for the smallpox patients, and it has not been used up to the present time.

All patients with contagious diseases have been treated at their own homes. No provisions have been made by the board for their removal to any other place. We have had very little sickness during the present year from contagious diseases. I am sorry I cannot give you any other information.

Yours faithfully

J. B. TWEEDALE.

At Brockville, where a fine new city hospital has been completed, a specially isolated ward has been arranged for. It is approached from an outside entrance, and special endeavour made to secure complete isolation. The local board have no special arrangements for sending persons from houses when they cannot be isolated; but they can be sent with consent of the trustees in the usual way of admittance. Close relations between the two may soon be expected to be established.

As most of these hospitals belong to the municipality there ought to be little difficulty in the Local Boards arranging with the hospital trustees so that those cases which the Medical Health Officer deems necessary should be received and treated. One difficulty has, however, been found in some of these instances where patients in stages of recovery have been discharged or allowed to leave the hospital before their infectiousness has ceased. It is due to the same difficulty already referred to, viz., the lack of any thing like a recognized specified time at which the contagion has ceased to be present, either on the skin or in the respiratory passages. It will be a matter for the Board to consider whether some regulation on this subject should not be passed and brought before the notice of the Local Boards. Its need is manifest, and we doubt not but that physicians generally would be glad of some regulation which would save them from the disagreeable necessity of having to apparently exercise the harsh duty of causing cases to be isolated when the acute symptoms have largely allowed the patient to dispense with their services.

The matter of notifying the Provincial Board of outbreaks of contagious disease is but part of the plan outlined in the Public Health Act, by which all executive officers can lend their aid in stopping the spread of these diseases. Manifestly while the Local Health officers may prove equal to the task of isolating disease within its own municipality there are frequently instances where persons have passed beyond their jurisdiction, who having been exposed may endanger the health of other communities. For such reasons it is most desirable that the Provincial Board should have early notice of outbreaks of disease of whatever kind, that they may where necessary lend aid to poor municipalities or make suggestions tending to more effective action in others.

But the compulsory necessity for the Provincial Board being kept informed of outbreaks lies in the duties laid upon it, under sec. 9 Public Health Act, of investigating outbreaks and of enquiring into the measures taken by Local Boards for suppressing such. That such notification was necessary under the Act was plain, but inasmuch as exact expression on the subject was wanting, the attached regulation was passed by Order in Council based upon the following resolution of the Board.

August 17th, 1888.

"Moved by Dr. J. A. Macdonald, seconded by Dr. H. P. Yeomans and carried, That while the principle of notification by physicians and householders to Local Boards of cases of infectious diseases is fully recognised in the Public Health Act by statutory enactments; yet, inasmuch as the question has been raised by several Local Boards, as to the interpretation of section 9 Public Health Act, cap. 205 R. S. O., 1887, by which the Provincial Board is to be informed of outbreaks of zymotic diseases such as cholera,

smallpox, diphtheria and scarlatina, the Board in order that it may comply with the agreement entered into by the International Conference of State and Provincial Boards regarding interstate notification of infectious diseases and further in order that it may carry out the duties laid upon it by said section 9, would request the Minister of the Department to bring the following recommendation adopted by the Provincial Board of Health before the Lieutenant-Governor for his sanction :

"That every Local Board and its Medical Health officer shall be required to at once notify the Provincial Board of Health of all and any cases of cholera and smallpox, and of such outbreaks of diphtheria and scarlet fever as occur within the limits of the jurisdiction of said Local Board."

COPY OF AN ORDER IN COUNCIL APPROVED BY HIS HONOR THE LIEUTENANT-GOVERNOR, THE 29TH DAY OF SEPTEMBER A. D., 1888.

Upon consideration of the resolution of the Provincial Board of Health passed on the 17th day of August last and upon the recommendation of the Honorable the Treasurer the Committee of Council advise that the following regulation be approved of by your Honor :

"That every Local Board and its Medical Health officer shall at once notify the Provincial Board of Health of all and any cases of cholera and smallpox and such other outbreaks of diphtheria and scarlet fever as occur within the limits of the jurisdiction of said Local Board."

Certified,

(Signed) E. F. B. JOHNSTON,
Clerk Executive Council,
Ontario.

That such notification becomes necessary in the interests of the municipality is often made frequently apparent. Within the last few weeks a telegram was received from the Secretary of the Provincial Board of Quebec enquiring whether small-pox existed in Winchester township, Dundas county, as it was reported that a girl had come to Montreal from a house where smallpox had recently been. Knowing of no smallpox there since April 1888, I was surprised at the report, but telegraphed for information ; answer was at once returned to the effect that the disease had existed in one family, but that all had recovered and that the disease had been confined to the first house. The facts were at once telegraphed to Montreal with the request that the suspect be quarantined if they thought proper.

The possession of this information has besides a wider bearing inasmuch as it enables the Provincial Board to maintain a close relationship with neighboring State and Provincial Boards. The utility of such is seen in the incident just related as also in the two illustrations which follow :

[INTER-STATE NOTIFICATION ISSUED IN COMPLIANCE WITH RESOLUTIONS ADOPTED BY THE CONFERENCE OF STATE AND PROVINCIAL BOARDS OF HEALTH AT TORONTO, OCTOBER 6TH, 1886.]

To Dr. P. H. Bryce, Toronto, Canada :

Boston, May 22nd, 1889.

SIR,—In compliance with the resolutions printed on the back of this notification it becomes my duty to inform you that a case of smallpox exists at Janeston in this State, in the person of a Belgian woman, immigrant. She arrived at New York, May 8th, on the steamer Nesterland from Antwerp. Took the disease from another case on board.

Respectfully, your obedient servant.

SAML. W. ABBOTT,
Secretary.

INTER-STATE NOTIFICATION OF DANGEROUS COMMUNICABLE DISEASES.

MICHIGAN STATE BOARD OF HEALTH
(Office of the Secretary),
LANSING, Michigan, May 28th, 1889.

To the Secretary of State Board of Health :

DEAR SIR,—In compliance with the resolutions adopted by the National Conference of State and Provincial Boards of Health at Toronto, 1886, and Washington, 1887, it becomes my duty to inform you that two cases of smallpox exist in Michigan, one at Detroit and one at Battle Creek. The person sick at

Detroit is Don Lewis, a resident, origin of disease unknown. The Battle Creek case is in a Polish family recently come from Detroit or Canada.

The measures taken to restrict are the removal of the Detroit case to the city hospital; and the immediate isolation of the family in which the Battle Creek case occurred. The danger of the disease spreading is not great.

Very respectfully,

HENRY B. BAKER,
Secretary.

This notification further gives the opportunity to correct erroneous impressions which may exist, regarding the health of the Province, in places with which we have commercial relations.

Thus the following correction of the Michigan notification was necessary.

[A SIGNATORY TO THE RESOLUTIONS ADOPTED BY THE INTERNATIONAL CONFERENCE OF BOARDS OF HEALTH AT TORONTO, OCTOBER 6TH, 1886.]

TORONTO, May 29th, 1889.

To the Secretary of State Board of Health:

DEAR SIR,—In compliance with the resolutions printed herewith, it becomes my duty to inform you that the last case of smallpox existed at Fingal (Southwold township), in the county of Elgin, Province of Ontario, in the person of Wilson Burrell, resident.

The origin of the disease was from exposure to previous case. This statement is made to correct the impression which might be created by the Michigan notification of May 28th, that a case of smallpox in Battle Creek, in the person of a Pole, had recently come from Detroit or Canada. No Poles live near the Fingal District.

You are authorized and requested by this Board to take such further measures for the protection of your territory, in conformity with the terms of the resolutions, as in your judgment may be deemed necessary.

I have the honor to be,
Your obedient servant,

P. H. BRYCE,
Secretary.

The constant commercial and social intercourse between adjacent Provinces and States through our railways makes the necessity for this work daily more apparent, as the methods of dissemination of these diseases become more evident and the means necessary to counteract the dangers better known.

III. ABATEMENT OF NUISANCES.

Perhaps it might be said that the less frequent complaints regarding the prevalence of typhoid and the existence of local nuisances, are due rather to a growing indifference to their existence than to any lessened frequency in their occurrence. There can be little doubt, however, but that this class of disease and of those nuisances which often are its close attendant, are becoming less common as physicians are becoming more advanced in prophylactic hygiene and antiseptic treatment of disease, while Local Boards are better acquainted, both with their powers under the Health Act and of the methods by which such nuisances can be lessened.

During the past dry and warm summer it was to be expected that nuisances, due to the lowering of the water in mill-dams and creeks running through towns, would be abundant. Such did exist to some extent, and amongst cases reported were

1. The Parkhill case, in which a creek was dammed up for mill purposes, and stagnant pools caused thereby were complained against. The Local Board took reasonable action under the circumstances.

2. The Wingham case is herewith printed in full, as illustrating some of the difficulties which Local Boards have in dealing with nuisances.

TOWN CLERK'S OFFICE,
WINGHAM, ONT., August 30th, 1888.

DEAR SIR,—I beg leave to again write you in reference to the mill pond nuisance in the river Maitland, forming the boundary line between the township of Turnbury and the town of Wingham. Full particulars of this matter you will find in my letters to you dated April 15th and 29th, 1887.

We found by amended Municipal Act, 1888, the county council was liable for all fallen timber and driftwood in streams forming the boundary between municipalities. We accordingly notified the county council of the county of Huron to remove the timber and driftwood in this mill-pond. A committee of the council came up and examined the place, but they claim that they are only liable for the debris in the main stream or original river bed, and not for the rubbish carried beyond that on account of the mill-dam across the stream raising the water and forming a pond.

To clear away the timber and driftwood in the main stream or original bed will not improve the condition of the nuisance any, as there is scarcely any timber in the main stream, nearly all of it being on either side of it.

The mill was destroyed by fire a few weeks ago, and is not likely to be rebuilt; the water has been let off and consequently the whole jam with all its accumulation of rotten wood and filth is in a better position than ever to spread disease among those living near it. At the C. P. R. station yesterday, with the wind blowing off the pond, the smell was almost unbearable. The county council will not agree to remove the nuisance, and we fear they are not liable. The owners of the mill privilege, on which most of it is situated, will not agree to do so; in fact since the destruction of their mill the property is not worth the expense. According to the Health Act the Local Board cannot undertake an expenditure so large as the clearing out of this pond would necessarily be. The municipal council of Wingham will not do anything in the matter, for the reason, no doubt, that only a section of the town is directly affected by the nuisance, and consequently the greater number of the electors would object to the expenditure.

Can you let us know who are the responsible parties, and how to proceed in the matter; if you will do so you will greatly oblige us.

I may say, this year, so far, we have no notice of any disease occurring directly from this pond, but last year there were three cases of typhoid fever near the place, and the pond is in a worse condition now than ever it was.

Yours very truly,

J. B. FERGUSON,
Sec. Board of Health,
Wingham.

3. The Thorndale case of another character shows how neighborly convenience is disregarded. The owner of a cheese factory pours his waste whey and refuse generally into the creek, from which the cattle in the farm below go to drink. The water becomes so polluted as to be refused by the cattle of the lower farm. An impotent Local Board refused to aid the injured to have his complaint rectified, which might readily be done under Section 4 of Schedule A of Health Act.

4. In the following letter from Glencoe is set forth a condition of affairs fortunately not common to many parts of the country, and yet by no means very rare.

GLENCOE, February 27th, 1888.

Dr. P. H. BRYCE,
Toronto.

SIR,—I have read with much pleasure and profit Dr. Griffin's paper on water pollution, as published in the *Globe*, February 16. The water supply in this western peninsula is very indifferent, many having no regard to the laws of health in these counties. In dry times milk cows and other stock are forced to drink out of holes scraped out in the pasture lot. It is common to see cows giving milk standing up to their bellies in mud and their droppings, drinking that filthy

stuff. I was appointed at our cheese factory to examine and test the milk as to purity. I said if they would allow us to examine the water I would cheerfully act. The reply was, "If you do away with ponds we will not send milk to the factory."

The township Boards of Health are generally the members of the council, many of them grave offenders. I know an ex-reeve who has a hole scraped in his barnyard. All the water from the roofs and surroundings soak through the dung and straw into the pond, and the milk cows and stock forced to drink out of that nasty hole, his stock coming out mere bones in the spring.

If you could get an act passed to stop such a system as I describe, and compel councils to appoint an officer specially to carry out the provisions of the law, it would, I believe, save many from sickness and, possibly, early death. Your Board has a great work before it. The extensive drainage of this western country has reduced the water supply, and we will have to get our supply from a considerable depth.

I would suggest that all scraped holes that have no outlets running clear be fenced, and, if possible, covered from the sun.

I remain yours,

THOMAS BECKTON.

The Acts printed in last year's report on the subject of milk supplied to factories will with the Health Act have to be the means, along with education, whereby these nuisances may be remedied.

5. The London sewerage difficulty, referred to in reports for the past three years, had not at last reports been overcome. In February of last year this Board was communicated with regarding a new proposition for obviating the nuisance, which was in substance that of pouring into the main sewer near its outlet, some "properly prepared chemical solution" to be mixed in a tank along the sewage by "agitators," this thereafter to be poured into the river, having been neutralized. These proposals of the Board were based upon some experiments by Prof. Bowman. It is hardly necessary to say that, apart from the fact that the results of the detailed experiments vary greatly from those of other experimenters, experience elsewhere has shown that this method would not do away with the nuisance complained of in any satisfactory manner.

6. The pollution of the Bay of Quinte just above Belleville by the sewage of the Deaf and Dumb Institute, is another matter which has been repeatedly brought before the Board by the Local Board of Belleville. The matter has been brought before the department which has that institution under its control, but no solution of the matter has yet been attempted. As the pollution of the bay takes place at a point half a mile west of the point of intake of the Belleville water supply, there can be no question as to the duty of the Government under the circumstances. The question of an injunction being served by the city upon the Superintendent of the Institute ought to be fairly considered by the authorities, since there is no reason why so simple a matter as the safe disposal of the sewage of 200 or 300 persons should not at once be carried out.

7. The Aylmer case still stands, and will, we suppose, until coming warm weather raises the question again. A dam at the upper end of the stream running through the town has been erected, with the result that malarial troubles are more or less common. The low stream in the village is insufficient to carry downward polluting matter, while suspicions have been raised against the character of the town water. Action proposed by the Local Board last year was not carried into effect.

8. Open ditches have been, in a number of instances in smaller towns, a source of serious complaint. One such complaint was preferred by parties in Tilbury Centre, in Kent County, that the Local Board refused to take action after complaint had been made. The matter was so clearly one with which the local authorities could deal that no inspection was made by this Board.

9. A complaint similar to that from Tilbury Centre was received from Morrisburg. The complaint states "the town of Morrisburg has water-works, the cart before the horse, and no sewerage," and the question is asked, "Will not the earth become

saturated with the refuse water and sewage, and cannot we, as a Health Board, compel the corporation to dig a drain or drains along the streets and let the water out of cellars of private residents. The council maintained that they were not bound to dig sewers along their streets or even to let householders drain into them." Manifestly the difficulty is one belonging to an early stage of civic evolution, and will be solved only through a general growth of knowledge and appreciation of the simple and easy method of dealing with house sewage.

10. From Tottenham a complaint of the same nature as that at Tilbury Centre was made, and a line of action suggested to that Board. The great difficulty is to get action taken.

Associated with the class of nuisances of which the above is a sample, are those relating to privies and disposition of night soil. Of these, complaints came from Grand Valley re disposal of night soil; another from Maxville, Glengarry, a privy nuisance due to a large hotel; and another from Omeme from the presence, on adjacent premises, of an old and decaying log stable with water and a large amount of animal matter, to the presence of which, it was claimed, several cases of fever and one death were due.

All these difficulties might readily be avoided by adopting the simple and economical plan of dry earth closets, carried out in the village of Leamington; and until Local Boards have made their general adoption compulsory, we need not expect to be free from complaints of the several kinds indicated in this last paragraph.

Associated with the same are those cases of typhoid fever reported, where evidently the *materies morbi* has been in well water. Of this class an unfortunate example occurred at the small village of Cooksville.

In early autumn the well at one house became perfectly dry, and water from the well on a neighboring premises was used, this well being situated just outside the back kitchen door. It pumped empty with very slight use. On this premises, some fifty yards away, was a slaughter-house, the effluvia from which contaminated the surrounding air in the evenings and during the night. Cases of typhoid occurred in house No. 1; thereafter in the house on premises where slaughter-house was; thereafter in the hotel near by, and in the houses of several other persons who had sat with the sick. While it is quite probable that some may have contracted the disease while nursing the sick, it is almost certain that the major part drank water from the suspicious well. A biological examination of the water showed it to be extremely impure from the numbers of bacteria contained in it; and that fatal cases occurred in those houses where the emanations from the slaughter-house contaminated the night air, is wholly in keeping with a number of other instances where cases of disease in the vicinity of such air pollution have been of an extremely virulent and fatal character.

10. From Peterboro' an outbreak was reported by Dr. Caldwell, occurring in a village a few miles away. The doctor reported ten cases in four families of his own practice, and rumoured cases in others; and the Local Board were extremely anxious that the water should be tested in wells which were suspected. It is extremely unfortunate that this Board possesses no facilities for making such investigations, thereby strengthening the hands of Local Boards in their endeavors to do efficient work.

11. Another case occurred at Port Dover, which illustrates the difficulty Local Boards at times have in carrying on their work. A nuisance was caused by a man, part owner of a well on the line between two lots. He had thrown out a heap of rubbish from a cellar-way, and caused thereby surface water to flow into the well, as tests showed, causing its pollution. He refused to comply with the Board's order for removal of earth until after a summons—the time for removal having been previously enlarged. Two days before the trial he caused the removal of the earth, but left the polluted well untouched. The case, brought before two magistrates, was dismissed with costs. Similar cases elsewhere might be given illustrating the action of justices who, to say the least, certainly have not aided in making the work of our Local Boards more easy or satisfactory. In this case the matter was referred to the Attorney-General's department for advice, but owing to the time the Local Board had allowed to elapse, appeal from the magistrates' decision was impossible.

The following letter from a Medical Health Officer illustrates first, the existence in country places of typhoid, which in almost every outbreak might be traced to wells, and further, the desire of Local Boards, even in rural localities, have to do the duties placed on them.

—, September 10th, 1888.

DEAR DOCTOR,—Kindly let me know how you would go about making an inspection as to the cause of typhoid fever cases in different parts of our township. We have a number of cases, some in one part and some in another, and a committee has been appointed to find out the cause. Kindly let me know your method of procedure, and also your tests for water without sending it to a regular analyst.

Yours truly,

_____,
Medical Health Officer.

IV.—INSPECTION AND REGULATION OF PUBLIC MILK SUPPLIES.

No department of sanitary work has, during the past year, shown more positive signs of progress than this one, of the first importance to every-day health. If we were to sum up the three dangers to life, which are constantly liable to be present, we would say, (a) unwholesome food, and food which is the bearer of the microbes of specific disease; (b) unwholesome air, and air which is the carrier of disease germs from sewers, foul cellars, workshops, schoolrooms, etc.; (c) impure clothing and utensils of whatever kind, which have been exposed to infection by personal wearing and handling, or exposure to contaminated atmospheres. But of all these we think milk the one most liable to be injurious. The sole food of infants, it is likewise depended upon as a nourishing diet for the sick and invalids, and yet being an animal food its liability to injurious influences begins with the health of the cow, the nature of the food and the manner of giving it, the cleanliness of the cow and of utensils from the moment of milking till it is consumed. For several years up to last year this Board of Health has, as will appear by perusal of past reports, urged the necessity for inspection of the sources and modes of handling milk supplies upon the attention of Local Boards, and toward the end of 1887 issued the following circular:

OFFICE OF THE PROVINCIAL BOARD OF HEALTH,
TORONTO, November 28th, 1887.

To the Chairman and Members of Local Boards of Health:

GENTLEMEN,—As you are doubtless aware clause 5 of the Public Health Act of 1887 provides that: "The Medical Health Officer under the direction of the Local Board of Health shall have authority to make or cause to be made by a veterinary surgeon, or such other competent person as the circumstances may require, a periodic inspection of all dairies, cheese-factories and creameries, dairy farms and slaughter-houses, which come within his or their jurisdiction;" and clause 6 of the same Act further places upon this Board the duty of enquiring into the various measures which are adopted by Local Boards throughout the Province in the interests of the public health.

In view therefore of the importance of the provisions contained in clause 5 of the Act already quoted, and of section 10 of Schedule A of the Act of 1884, and owing to information received from time to time to the effect that no systematic inspection of public milk supplies exists in many municipalities in the Province, the Provincial Board recognizing the, now well-ascertained, dangers of the transmission of typhoid fever, diphtheria and other infectious diseases by means of impure milk, has instructed its committee on Foods and Adulterations to prepare for distribution to Local Boards certain recommendations, which it is hoped will form a basis for such regulations as the Local Boards of the several municipalities will deem proper to adopt. The fact that there are many rural municipalities, where there is no so-called public milk supply, will not, it is hoped, prevent their Local Boards from insisting, in the public interest, that the precautions which are deemed necessary for larger places, be carried out by those farmers residing in their districts who may be shippers of milk to cheese-factories, creameries

or to the large centres. In order that such inspections may be effective and systematic we have arranged in order the following Regulations :—

Reg. 1.—All dairymen and vendors of milk shall, at least once a year, register with the Medical Health Officer, or Secretary of the Local Board, where no such Medical Officer exists, of the municipality (in a register supplied by the Board for such purpose), (1) their names and addresses, (2) the source or sources of their milk supplies, (3) the number of cows in their possession, (4) the average quantity of milk disposed of either (a) to milk-shops, (b) milk vendors, (c) or to private consumers.

Reg. 2.—That at such registration, a statement be made by all keepers of cows for public supplies as to the kinds of foods supplied to their cows ; if (a) of brewers' grains, (b) distillery slops, (c) starch factory by-products, (d) ensilage or (e) oil-cake ; the amounts in proportion to the total food supplied.

Reg. 3.—That periodic inspections be carried out under direction of the Board by its Medical Health Officer or Sanitary Inspector, in accordance with the spirit and provisions of section 5, Health Act, 1887, and section 10, Schedule A, Health Act, 1884.

Reg. 4.—That the dairyman or milk-vendor agrees, as a condition of receiving license, to comply with the various clauses of the Health Acts, by giving notice to the Local Board of any cases of contagious animal diseases (defined in said clause of Public Health, 1887), occurring amongst his cattle, or of any scheduled contagious diseases in his family, or in the farm, house or shop at which, from which, or in which the milk is either sent or received, and that he further shall carry out the restrictions laid upon him by the Local Board under any Public Health Act.

Reg. 5.—The milk-vendor agrees to provide milk of a standard quality, the test values of each grade of milk to be as follows :—

Grades.	Solids.	Fat.
No. 1 Quality.....	14.00 per cent.	4.75 per cent.
No. 2 “ 	13.00 “	4.00 “
No. 3 “ (Government minimum average)	12.00 “	3.50 “

Reg. 6.—That the Local Board through its Medical Health Officer shall grant a yearly license to each dairyman, milk-vendor and milk-shop, after compliance of said person with the provisions of said regulations ; provided that at any time such license may be recalled on sufficient proof being had by said Board or its Officer of violation of the terms of the Regulations, or of any clause of the Public Health Acts.

The following form for Register is suggested :

FOR REGISTRY BOOK.

Name.	Address.	Locality or Source of Supply.	No. of Cows.	Quantity of Milk Supplied.		Food Supply.	I hereby agree to report at once any infectious diseases that may occur in my family, or in my house or shop, and whatever disease may occur amongst my cattle to the Medical Health Officer of this municipality.
				To Dairies	To private people.		
							Date,
							Signature,

The following is similarly suggested for form of License :

Mr. _____ of _____ (Dairyman, Milk-vendor or Shop-keeper,) having agreed to conform with the terms of the Regulations printed herewith (on reverse side) is hereby authorized to engage in the business of dairyman, milk vendor or shop-keeper for the period, included between _____ and _____, always providing that should any violation of any provision of the Health Acts or Regulations be proven, as of the agreement to supply milk of a standard quality, neglect to keep premises in first-class condition as regards cleanliness, water used, etc., as required by said Local Board or its Officer, or as regards infectious diseases, said license may at any time be cancelled.

Issued this _____ day of _____

.....
(Signed for Local Board.)

It is hoped that the suggested Regulations may be instituted everywhere throughout the Province at the beginning of 1888 ; in order that this, of all sources of food the most important, may be supplied of the best possible quality, to the mutual advantage both of seller and consumer.

We have the honour to be,
Your obedient servants,

FRANCIS RAE, M.D., Chairman,
C. W. COVERNTON, M.D.,
P. H. BRYCE, M.A., M.B., Secretary,
Members of the Committee on Epidemics.

Perusal of the Reports of the Local Boards found in Appendices will indicate fairly well the general attention which has been paid to milk inspection ; while further replies from the following places have been made to a card asking for specific regulations on the subject.

CITIES.

Toronto.—According to the Annual Report for 1888 it is stated : “ That the Medical Health Officer drew up a Report (dated March 15th, 1888,) setting forth the necessity of having the dairies, creameries, etc., thoroughly inspected, but owing to the large amount of important business before the Board the matter was left over for future consideration.”

Ottawa.—Without any special by-law on the subject having been passed other than that contained in Schedule A, section 10, which is sufficient for the purpose, the Board issued a license after the form proposed in the circular. Inspection of dairies is made by the Sanitary Inspector or Medical Health Officer of the Board. Results have been very satisfactory as regards improvement in quality of milk supplies, etc.

Hamilton.—A special by-law was there passed and the work undertaken in a systematic manner. In order that the Board might be placed in the strongest possible position in any action which it might find necessary to take, it sent its Medical Health Officer on a tour of inspection of methods of testing milk supplies to New York, Boston, etc., and having returned he arranged for the work of regular inspection. Particulars will be found in the Annual Report of the Board printed herewith.

London.—No special by-law other than Schedule A, sec. 10, has been passed, with a resolution of the Board requiring the issue of a special license. The Annual Report shows that under the supervision of the Medical Health Officer most thorough and efficient inspection and testing have been carried on, resulting in a notable improvement of the quality of the milk supplies.

Brantford.—Amongst those who undertook the work most promptly was the Brantford Local Board, and proceeding under Schedule A, sec. 10, issued a license given upon condition, signed as an undertaking by the receiver thereof, that he would comply with regulations similar to those contained in the form suggested in circular. The work has been most satisfactory as regards improvement of standard. Inspection of dairies is made periodically, and testing of sample every two months, and the results are

published in the city press. As a sample the following report is given which may prove of use to other Boards :

HEALTH OFFICE,
BRANTFORD, September 15th, 1888.

Milk tests made in September, shewing specific gravity of the various samples and also the percentage of butter fat as estimated by the lactoscope. Published by order of the Board of Health.

E. GRIFFIN, M.D.,
Medical Health Officer.

SAMPLES TAKEN FROM THE DELIVERY WAGGONS OF THE MILK VENDORS.

No. of Sample.	Specific Gravity at 60 Centigrade.	Butter Fat Percentage.	NAME OF VENDOR.	No. of Cows in Dairy.
1	1032	3.13	W. Dickie.....	28
2	1031	3.25	R. Greenwood.....	9
3	1030	3.25	Foulds Bros.....	30
4	1031	3.25	J. Alexander.....	11
5	1032	2.88	J. Crewe.....	21
6	1029	3.25	J. Burton.....	11
7	1031	3.13	G. Craddock.....	18
8	1031	3.	R. Portus.....	39
9	1030	2.75	J. Britain.....	30
10	1031	3.	Brooke & Son.....	36
11	1033	3.13	S. K. Passmore.....	20
12	1029	3.75	W. D. Snider.....	18
13	1032	3.63	W. Reed.....	3
14	1032	3.13	J. A. Willis.....	9
15	1031	2.63	James Lee.....	12
16	1033	3.	D. Duncan.....	11
17	1031	3.25	Richard Burke.....	11
18	1033	2.75	F. Wilkes.....	2
19	1030	3.75	Mrs. Knowles.....	2
20	1031	3.50	J. Jackson.....	4
22	1030	3.25	W. Read.....	10
23	1031	3.	G. Walter.....	18
24	1032	3.25	P. Maloney.....	5
Average		3.17	No. of Cows.....	358
Highest.....		3.75		
Lowest		2.63		

SAMPLES OF WHOLE MILK FROM TOWNSHIP HERDS, NOT CONNECTED WITH THE CITY MILK SUPPLY.

Sample.	Sp. Gr.	Butter Fat.	NAME.	Cows.	Remarks.
A	1032	3.75	G. Hill	30	Common grade cows ; only feed poor pasture. Grade cows ; half their feed is green corn cut, the other half exceedingly poor pasture.
B	1031	4.00	F. Reed.....	27	
C	1032	3.75	C. Summerhays.	4	Grade cows ; only feed pasture, not very good. Good cows ; fed on pasture, with a little chopped grain.
D	1032	4.50	D. Luck.....	4	
Average		3.90		65	
Highest.....		4.50			
Lowest		3.75			

The minimum standard recommended by the Provincial Board of Health is 3.50 per cent.
The minimum standard in the State of Massachusetts is 3.70 per cent.

From the above it will be seen that—

3·75 was the highest percentage of butter fat in the 23 milk vendors' samples.
 2·63 the lowest percentage, and
 3·17 the average
 4·50 was the highest in the whole milk samples.
 3·75 the lowest, and
 3·90 the average.

Only 4 of the milk vendors' samples, representing 27 cows, were up to the minimum of the Ontario Board of Health.

The remaining 19 samples, representing 323 cows, were below the minimum of 3·50 of the Provincial Board of Health.

The low percentage of 3·17, average of all the milk vendors' samples, is doubtless due in part to bad pasturage this season; but there does not appear to be any good reason for these samples shewing only 3·17, while the whole milk samples of non-vendors, having common and rather poorly fed cows, shows an average of 3·90.

If milk at 3·17, the average of the above 23 samples, is worth 5 cents per quart, then the highest sample, 3·75, is worth 6 cents, and the lowest, 2·63, 4 cents: and 1st quality rich milk like sample D above, with a percentage of 4·50, is worth over 7 cents per quart.

N.B.—We intend hereafter to publish account of condition of dairies, of cattle, quality of food, etc., etc.

Guelph.—No new by-law, but regulations after the form suggested in circular and a license were issued by the Local Board and periodical inspections of dairies were made. To illustrate the need, it may be mentioned that the Sanitary Inspector discovered that several cows of dairymen had suffered from anthrax, and that owing to the acute character of the disease it is not improbable that for a day or two before its onset these animals had been supplying milk altered in quality to the public.

Kingston.—Owing to persistent doubts on the part of the city solicitor as to the powers of the Local Board under Schedule A, the Local Board, after several attempts, have very recently succeeded in getting a by-law passed under the provisions of the Municipal Act regarding the inspection of foods. The length of the by-law ought to insure perfect inspection and, we trust, that the Board will be able to perform good work under its provisions.

St. Catharines.—Has made no provision for the regulation of dairies apart from the ordinary inspection which may be carried on under Schedule A of the Act.

Belleville.—Here the work was very efficiently carried out last year without special by-law, but now a special by-law has been passed and provision made for a license fee of \$1. A registration of all vendors is provided for in a book kept for the purpose. The forms for license and registrations, as also the regulations, are similar in form to those of the circular.

St. Thomas.—No regulations are in force there, but we trust to soon learn that regulation and inspection of dairies is being regularly carried out.

TOWNS.

Brockville.—Has a printed form of license similar in its provisions to that of Brantford, with an undertaking signed by the dairymen to carry out the regulations.

Walkerton.—Has a license and agreement similar to that contained in circular issued by the Board.

Orangeville.—Similarly has the two forms of license and agreement with the regulations as suggested in the circular.

Prescott.—The Local Board, by special resolution, have instructed the Sanitary Inspector to inspect and report to Board on all the dairies. No regulations have been adopted or licenses issued.

Trenton.—Issues a license in which the vendor agrees to supply milk up to the standard of circular, to keep premises in good condition, and report all contagious disease. A license fee of \$3 is collected and a veterinary surgeon employed to inspect cattle, and a register of all vendors is kept.

Chatham.—Has a by-law passed under sect. 489 sub-sec. 53 of Municipal Act, by which Medical Health Officer and Sanitary Inspector are appointed Milk Inspectors, and are empowered to inspect as under clauses *re* food adulteration; also a penalty for obstructing inspectors; for having stamped measures, and penalty for not having same; 14 per cent. solids and 3 per cent. butter-fat are the minimum standard of quality.

Simcoe.—Carries on the work of inspection and regulation under the amended by-law, Schedule A, of the Act.

Windsor.—Has carried on the work of inspection of dairies under the provisions of Schedule A, but has now under consideration a special by-law on the whole subject.

Owen Sound.—Has adopted the form of regulations and license set forth in circular making, however, 3 per cent. the minimum standard for butter fat.

Perth.—Has an inspection carried on under the amended Health By-law for the town, but no special regulation as licensing of dairies.

Kincardine.—Has a by-law under preparation looking to the close inspection of all milk supplies, whether for direct consumption or for use in creameries or cheese factories, and of cow-byres and dairies.

The following places have reported that no regulations or licensing of dairies are in force: Galt, Collingwood, Peterborough, Cobourg, Listowel, Mount Forest, Berlin, Ingersoll, Wingham, Woodstock, Stirling, Whitby, L'Orignal, Exeter, Thorold, Madoc, Meaford, Shelburne, Milton, Deseronto, Petrolia, Springfield, Aylmer, Tara, Port Stanley, Caledonia, Brussels, Bowmanville, Vienna.

We thus learn from the preceding reports the general condition of the milk supplies of the Province. Of the eleven cities seven are in a position to do effective work, and reports found in the annual returns show that good progress has been made. Of the towns some eight have taken steps to enforce systematic inspection of dairies, while a number of other places institute a general inspection of byres.

When it is remembered that the great proportion of our towns and villages have a population under 4,000, and many of them not more than 1,500, that as stated in answers to the circular some of these have no dairies within the corporation and that many persons keep cows of their own, it is manifest that though the necessity may exist on private premises for sanitary inspection in the matter of cleanliness, yet the extent of ground around each house, the limited number of animals on each, and the fact that the use of the milk is in most cases limited to one or two families make the necessity for inspection in these municipalities very much less than where the milk supply is by general distribution from several large dairies.

Some difficulty has been experienced by Medical Health Officers with reference to standards, which may be enforced, as also the means whereby the quality of the milk may be tested or established. Experience has, however, indicated the practical value of the lactometer and lactoscope, since those circumstances which affect its exactness do not exist practically under the ordinary conditions. We trust that other places may take advantage of the experience of those which, have during the past year regulated the sale of milk, and that a year hence will find a still closer watch kept over this source of food supply and national health.

SEWERAGE SYSTEMS.

In the report of the Secretary for last year remarks were made at some length upon the matter of "water supplies or their sanitary relations." Therein were discussed the conditions of soil, as regards ground water and organic pollution, which most notably affect the public health and the necessity for not only surface purity of the soil but of its aeration and drainage were set forth. Bearing directly, however, on the question of pure water supplies, is that of sewage disposal, since in the past it has been the rule, and is likewise too much the same at present, that rivers and lakes which are made the receptacles for the sewage of towns and cities are likewise the source from which supposedly pure public water supplies are obtained. That it should be possible for such unfailing sources of supply to be made safe from the sanitary standpoint does not admit of question, and yearly the matter is becoming a more urgent one to Ontario, where public water works are being increasingly introduced, thereby making the construction of sewerage works a corresponding necessity.

During the past year several towns have introduced public water supplies. Thus Goderich, Cornwall, Brockville, Brantford, Berlin, Cobourg, Wiarton, etc., have new public water, while nearly all of those cities where it has been already introduced have had to increase the capacity of their works. The question assumes further an additional importance owing to the fact that the demand for water increases *pari passu* with an increased pollution of those sources from which it is obtained.

The soil around a polluted well becomes yearly more polluted, while the demand on the well ordinarily is increased; while the streams with a less yearly quantity of water flowing into them owing to the drying up of the springs at their sources with the clearing away of the forests, are receiving from the growing populations on their banks a still larger amount of pollution.

But the two questions of pure water and proper disposal of sewage cannot by any casuistry be evaded; they have existed, and must exist, in every country where aggregations of people in settled communities exist. They are not absent even where numbers, as armies, are in movement. In Canada, there are as yet only a few places where positive necessity has forced cities and towns to act; but fifty years and more have with widening knowledge made many communities aware that their civic advancement—not to mention their public health—demands in the interest of commerce that they are possessed of these two modern conveniences, the gauge of a town's prosperity. Where does the capitalist look for a profitable investment? Not in a malarial town, without public drainage, not in a town where the public water if present is known to be bad, not in the place where there is no public supply for mill-wheels and steam power; but in those places where faith in the town's future has caused its councillors at the voice of the people to issue debentures as a business investment, for constructing works of these two kinds. The Southern States, only now arousing with new hope from the disastrous results of the recent war, recognize as the first condition of attracting capital that their towns must be supplied with water which is good, and sewerage works which are modern in their character and sufficiently extensive to relieve the soil from those organic pollutions which make yellow fever a scourge. In 1878 Memphis was decimated and her sad experience was the occasion of originating a system of separate sewerage, her absolute safety for the past ten years. Last year Jacksonville was similarly scourged, and we see her to-day having one of the most experienced engineers engaged in plans for perfecting her sewerage. Other cities living in dread, are only awaiting their ability to similarly protect themselves from this dreaded disease. England learnt a similar lesson, only after scourging from cholera and typhus; and North American cities have learnt the lesson in part—only after typhoid epidemics have ravaged them and diphtheria has borne away its victims. But the lesson is only partially learned; large cities, like Philadelphia and Cincinnati, are still using polluted river water and having deaths from typhoid running up to many hundreds annually.

Hospitals are erected and collections and endowments devoted to the support of fever wards in these cities, whereas if the Schuylkill and the Ohio had their *periods of purification* before mingling with the people, thousands would yearly have cause to bless the intelligent managers of public affairs, while the donations from public charities would have other avenues wherein to do their holy work.

Speaking for Ontario, it may fairly be said that those public works begun during the past few years have indicated an intelligent appreciation of the fact that both public water and public sewerage may become a curse as well as a public blessing. In no single case wherein by sec. 30, R. S. O. 1887, it has become the duty of a municipality to place their plans for approval before the Provincial Board of Health, has there been shown a desire to introduce works which were not likely to prove a benefit to the public interested. There have been practical financial considerations which may at times have prevented a municipality from doing all it would have wished, but water from pure sources has been sought, and sewage has been disposed of only temporarily in such manner as might be likely to prove detrimental to the public interest. Amongst the problems which have come up for solution is the disposal of Toronto sewage. The conclusions of the most recent expert examination are referred to on a later page of this report.

At Cornwall the question of disposal became an easy one, since the water had only to be carried into the current of the St. Lawrence rapids to be disposed of, we may fairly assume, with safety. Similarly at Brockville the sewage is forced far out into the St. Lawrence and lost sight of. At Owen Sound complaint is still made that the sewage is not carried far enough, but it may fairly be expected that, with the rapid development of that town, the sewage will be carried farther till it be forced into the lake waters. At London the pollution of the river still continues; but a fraction of the evil at this place is likely soon to be remedied by the sewage from the insane asylum being disposed of by means of a sewage farm.

These illustrations suffice to show that such work as is being done is being done along advanced lines. I am not aware of any place where sewerage works have been recently introduced in Ontario where the separate system has not been adopted. Three years ago Mr. Alan Macdougall, C. E., devised such a scheme for Stratford, while within the last two years Cornwall and Brockville have built separate systems under the guidance of Mr. Willis Chipman, C. E.; while Col. Waring has similarly disposed of the sewage of the London Asylum. What, however, our various towns and cities which have not yet constructed sewerage works want to know, is how their work may be done and at what cost.

Two years ago when Mr. Macdougall outlined a system of separate sewerage for Stratford, his estimate was based upon the prevailing figures of cost in American cities; but not until the Brockville system has been constructed has it been possible for me to obtain figures of actual cost of a system of separate sewerage in Ontario. I propose, therefore, to utilize for the benefit of interested municipalities figures from reports supplied by the town of Brockville.

Before referring to the questions of cost it may not be improper to state in a few words what work is included under the term "Separate System." In last year's Report Dr. Oldright, the Board's delegate to the "American Public Health Association," had an opportunity of inspecting the Memphis system of separate sewerage. In it he refers to "the small-gauged sewers of the system, excluding all storm and rain-water." Perhaps it would not be improper to call them *sewage* sewers in contradistinction to drains for storm and surface water. Such systems now exist in many other places, as at Pullman, Ill., Binghamton, N.Y., Norristown, N.J., Schenectady, N.Y. Says Prof. Staley and Mr. Pierson, C.E., regarding it, "The introduction of the separate system marks an important era in the development of sanitary drainage, recognising as no other system has, the prime importance of an early removal of household and industrial wastes, which are the main factors in soil pollution. That it will best meet the requirements of all large and dense populated cities (economy considered) is not probable. That under competent advice, it can meet the requirements of *house drainage* more perfectly in any

city than the combined system, cannot be denied. It is peculiarly adapted to many of the numerous smaller cities, which have been practically debarred from sewerage by its cost, and to outlying portions of larger ones. Its comparatively small cost permits an early and general extension, and the removal of domestic wastes before the soil has become saturated with them beyond a reasonable hope of purification."

These writers further show that seven-eighths of all the cities in the United States have a population less than 25,000, and about two-thirds less than 10,000 inhabitants.

From the statements here quoted it is manifest that for Ontario we have in the "separate system" one almost universally applicable.

With regard to the general characters of the system I cannot do better than quote the words of the Brockville report as given by the Engineer, Mr. Chipman :

"1. The system of sewers adopted in the town of Brockville is the Modified Separate System, and is designed to carry off (1) liquid house wastes, (2) excreta, (3) a limited amount of roof water, (4) sub-soil water, (5) cellar water.

"2. The main sewers and laterals consist of vitrified, salt-glazed sewer-pipe, called *sewers*, designed to carry the liquid house wastes, excreta and roof water.

"3. Alongside the *sewers* are laid agricultural drain tiles, designed to carry the sub-soil water and cellar water.

"4. This system is not designed to carry street water, garbage, ashes, vegetable parings or rubbish."

When the system is completed the sewage from the whole town except the small portion west of Shepherd Creek and south of the G. T. Railway will be conveyed to one outfall at the lower end of the town and discharged through a submerged iron pipe into the river.

The sizes and grades of sewers adopted are such that sewage entering a sewer from any of the buildings farthest removed from the outlet along the line of sewers will be discharged at the outfall in less than 90 minutes.

At the head of each sewer is placed an automatic flush tank, arranged to discharge 200 gallons of water as often as may be desired. This volume of water being discharged through a large opening under considerable head, completely fills the 9 inch pipe for several hundred feet at minimum grades, and insures a thorough flush where most required, at the point where the average regular flow is the least. The flush tanks now in operation are working perfectly, keeping the sewers clean at all times with a comparatively small quantity of water. * * * *

Construction.—"With the exception of the sewers on Water street and on Thomas and Ann streets, all sewers have been laid in the centre of the street, and in all cases each sewer has been laid with a uniform grade and in a straight line between manholes or between a manhole and a lamphole or flush tank.

By this method of construction any section of a sewer can be readily inspected and easily cleaned if necessary. The loss of velocity by adopting successive chords instead of a curve is small, and the advantages are so great that in only one place has a curved pipe been used in the street sewers; the junctions of mains and laterals being made inside the manholes.

Junctions were put in for every house and opposite each vacant lot at such points as the owner directed. In the absence of the owner the engineer or inspector placed them as he thought best." * * * *

Materials.—"Scotch sewer pipe was used on Water street, east of tunnel, and on Thomas and Ann streets. On all other streets Standard sewer pipes, manufactured at St. John's, Quebec, have been used.

Considerable difficulty was experienced in getting proper sized drain tile in such quantities as we required at different times during the season, a difficulty that will probably not occur again.

Portland cement and Brockville bricks have been used throughout.

The cement used was tested by subjecting briquettes of one square inch cross section to tensile strain after 24 hours immersion in water after setting. This test, although not favorable to slow setting cements, is probably the best of any for cements for jointing sewer pipes. What is there wanted is a quick-setting cement, especially in wet trenches."

Records and Plans.—"Records have been kept of the work done showing the grade and depth of every sewer, the location of all manholes, flush tanks, lampholes, etc., the positions of all gas mains, water mains, drains, and the service pipes for gas and water met with in the trenches. Also the position and extent of all rock excavated.

The profiles and plans upon which tenders were called have been converted into *final* plans by plotting therein all Y junctions, gas and water pipes, drains, rock excavation, etc., but it would be better if proper final plans were prepared, the sheets to be uniform in size and bound into volumes after completion. In a few years the present profile plans will be worn out from frequent reference."

We have thus given an outline of the nature of the work done in Brockville during the past year, or being at present carried on. As it is the first town in Canada in which the cost of the "separate system" has been established by actual experiment, I shall quote the table of cost as given in the report.

EXPENDITURE FROM NOVEMBER 1, 1887, TO DECEMBER 31, 1888.

lix.

Sewer.	Labor.	Materials.	Sundries.	Engineer- ing.	Inspect- ing.	Total.	Per centages unpaid.	Total cost of Sewers or of part completed.	Length of Sewers completed in feet.	Cubic yards of rock.	Contractors for Labor.
	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.			
General .....	.....	110 26	158 90	71 00	.....	340 16	.....	340 16			
Main outfall.....	4,480 40	2,448 12	47 37	145 00	78 00	7,148 89	.....	7,148 89	923	4	J. F. Ward.
Water Street E. Tunnel	3,455 51	1,340 50	320 49	200 30	225 00	5,541 80	742 33	6,284 13	1,020	487 {	Wood & Logan, Harry Welch.
Thomas and Ann	2,350 88	589 44	47 80	145 75	128 00	3,270 87	62 20	3,333 07	1,254	521 {	Wood & Logan, Wm. Donovan.
*Water and Jane, Sec. 2.....	1,666 18	1,203 80	39 14	44 00	75 50	3,028 62	524 88	3,553 50	1,272	70	Harry Welch.
Broad	150 75	165 16	2 65	12 50	18 00	349 06	.....	349 06	367 $\frac{1}{2}$	5	McGuire & Jackson.
Market	1,161 93	485 24	30 61	78 50	51 00	1,807 28	128 17	1,935 45	1,302	1 $\frac{1}{2}$	Armour & Cunningham.
Orchard	1,131 75	463 92	19 96	70 00	43 00	1,728 63	125 75	1,854 38	1,175 $\frac{1}{2}$	5	S. A. Wilsie.
Ormond and Pine	949 91	356 94	12 34	71 00	60 00	1,450 19	105 54	1,555 73	879	53	M. Brady.
Bethune and branches	2,079 74	1,241 50	33 93	167 75	167 75	3,690 67	520 03	4,210 70	3,277	25	T. J. P. Doddridge.
+King, West	883 48	263 12	11 48	84 50	100 00	1,342 58	280 22	1,622 80	731 $\frac{1}{2}$	139	J. D. Swartwout.
+King, East	1,201 00	217 70	7 78	74 25	64 50	1,655 23	274 68	1,929 91	600	207 $\frac{1}{2}$	Armour & Cunningham.
Plumbing .....	.....	.....	60 45	60 00	65 00	185 45	.....	185 45			
Total	19,560 53	8,885 70	792 90	1,224 55	1,075 75	31,539 43	2,763 80	34,303 23			

* Completed in January, 1889, at an additional cost of about \$350.

† Not yet completed.

From this table we learn that "the average cost per lineal foot of the 9-inch sewers built as local improvements on Market, Orchard, Bethune and branches and Ormond and Pine streets, has been about \$1.55. The average cost of the main sewer east of the tunnel about \$3.88 per foot, and the cost of the part west of the tunnel about \$2.80 per lineal foot." Part of this was more expensive than was estimated owing to there being more rock than was anticipated.

I have compared these tables of cost with those of the cost of works of a similar character given by Staley and Pierson in their work. The total cost in Schenectady was .72 per lineal, while that given as the cost of a section for Keene, N. H., is given at \$1.29½ per lineal foot. It is remarked, however, that those low costs could probably not be repeated owing to the prices of labor, material, etc., and that from 10c. to 20c. on these estimates should be added.

The cost of the Brockville system when the uneven character of the soil, the very considerable amount of rock excavation, the new character of the work, and the difficulty in getting the proper materials just as required, are considered, cannot be thought of as other than moderate, and it may fairly be assumed that in the great majority of towns in Ontario the price of the work would be very considerably reduced.

From the estimates given it is manifest that the question of financial ability on the part of any of our growing towns to provide sewerage for the benefit of its citizens is solved in the affirmative, and with plumbing now reduced to a system greatly simplified in its details and cost, we may fairly affirm that with public systems of water supply, where this is from a reliable source, and with plumbing and sewerage properly constructed it will be possible to practically eradicate those diseases which are due to bad water and sewage from houses.

But much of the permanent benefits to be derived from a sewerage system in any town will depend upon the systematic superintendence of all parts of it by the town engineer's department. To this end it is necessary that not only should plans and details of all street sewers be carefully made and preserved but also that the same be made of all house-drains and plumbing. Houses are sold or rented by successive tenants and often it is impossible without much trouble and expense to discover afterwards their location and construction. The following outlines for a registration of plumbing and house drainage plans, supplied by the Brockville sewer commissioners may be examined and with advantage followed.

The first step is where a householder gets notice from the medical health officer, when a street sewer has been constructed to put in house plumbing and drainage to connect with the sewer.

FORM I.

OFFICE OF THE BOARD OF HEALTH.

BROCKVILLE, Ont., ———, 188—.

To ———

TAKE NOTICE.—That the discharge of house-wastes and sewage through the drain from your premises, situated on the side of street, between street and street, is contributing to create a public nuisance, and is liable to contaminate the public water supply.

You are therefore notified that the use of such drain for discharge of house wastes and sewage is hereby prohibited. A continuance of the nuisance will be followed by a prosecution as provided by statute.

A proper public sewer is now constructed on the street adjoining the above premises, designed to carry all your water wastes from sinks, baths, water closets, etc., and it is desirable that you should make proper connection with it.

By applying at the office of the Sewer Commissioners, all necessary information respecting the making of connections with the street sewer can be obtained.

(Signed) HARRY E. VAUX, M.D.,
Medical Health Officer.

Application as per the following Form II. is made to the Sewer Commissioners to construct a house sewer and plumbing.

FORM II.

Application for Sewer Connection.

No. 30.

BROCKVILLE, 20th April, 1889.

To the Sewer Commissioners:

I, the undersigned, hereby apply for permission to construct a house sewer and make sewer connection with the main sewer on Orchard Street, from premises situated on the east side of Orchard Street, between King Street and Pine Street, owned by Geo. R. Webster, to be occupied by Geo. R. Webster as a residence. The plumbing fixtures are as follows:—Bath tub, kitchen sink, two wash bowls, and one water-closet, which work is being done by plumbers, Stetsen & McBrearty, about April, 1889. (See plumbing application No. 13).

I hereby agree that all work done shall be strictly in accordance with the provisions of the "By-law regulating the sewers in the town of Brockville," and the "Rules and regulations prescribed by the Board of Sewer Commissioners," and that all claims against the town of Brockville or the Board of Sewer Commissioners for damages occasioned in any manner by the execution of the above work shall be satisfied by me.

(Signed) GEO. R. WEBSTER, Owner.

GEO. R. WEBSTER, Occupant.

Diagram.

Permit granted, 20th April, 1889.

Work commenced, before April 20th—inside.

Work completed, 23rd April.

Inspected by S. A. Logan—saw connection made and pipes laid.

Dates of inspection, 23rd April.

Remarks. Work done by Stetsen & McBrearty.

As per the following Form III., the application is granted.

FORM III.

BROCKVILLE SEWERS.

House Sewers and Drains.

Permit No. 23.

Date, 20th April, 1889.

Application No. 30.

To Geo. R. Webster.

Work to be commenced, at once.

By Stetsen & McBrearty.

BROCKVILLE SEWERS.

House Sewers and Drains.

No 23.

BROCKVILLE, 20th April, 1889.

Permission is hereby given to George R. Webster to execute the work specified in application for sewer connection No. 30, in accordance with the provisions of the By-law regulating the sewers in the town of Brockville, and the rules and regulations prescribed by the Board of Sewer Commissioners.

(Signed) WILLIS CHIPMAN,

Engineer.

The owner then engages a plumber to prepare a specification, and having made an estimate of cost the plumber submits his plans for approval to the engineer of the department, as per Form IV.

FORM IV.

BROCKVILLE SEWERS.

Plumbing Application No. 13.

BROCKVILLE, Ontario, 10th April, 1889.

To the Sewer Commissioners:—

We, the undersigned, hereby apply for permission to do the plumbing work in the premises on the east side of Orchard Street, No. 217, owned by Geo. R. Webster, in accordance with the following description and plan :

Fixture.	Pattern.	Waste.		Size Trap.	Vent.	
		Size Inches.	Weight per foot.		Size Inches.	Weight per foot.
Water closet.....	Sanitary.				Room vented into cock-loft by shaft 8 x 12. All to be done according to rules and regulations.	
Bath tub	Copper, 14 oz.					
Wash bowl	Oval, marble.					
Kitchen sink ... {	Cast iron 30 x 18.					
Slop hopper						
Urinals						
Fixed wash tubs..						
Fixed wash trays..						
Soil pipe.....	Cast iron.....			None.....		Vent through roof.

We hereby agree to conform strictly to all the rules and regulations adopted by the Sewer Commissioners, and to give due notice when work is ready for inspection.

(Signed) GEO. R. WEBSTER,
Owner or Agent.

(Signed) STETSEN & McBREARTY,
Licensed Plumber.

The work having been completed the department is notified, and an inspector sent to examine the work and to report.

The following illustrates such report :

FORM V.

BROCKVILLE SEWERS.

Plumbing Inspections.

April 22nd, 1889.

Inspected plumbing on first floor, found plumbers at work on sink connection.

(C. J. M).

April 25th, 1889.

Inspected plumbing. Found vent pipe of basin too low below top of trap to prevent syphoning. Notified plumber to have it changed.

C. J. M).

April 26th, 1889.

Found vent for the basin trap altered to top of said trap. Found vent of water closet connected by a party joint; ordered its removal, and that a rubber joint be used instead.

May 1st, 1889.

Inspected plumbing. Applied water test. Found everything satisfactory.

CESURE J. MARANI.

The work having been finally completed to the satisfaction of the department, a compend of the work is made and filed away in the ledger of the department of the Sewers Commissioners for future reference, as per the following form :

FORM VI.

BROCKVILLE SEWERS.

Plumbing Inspections

Application No. 13. Date, 10th April, 1889. Plumber, Stetsen & McBrearty. Owner, Geo. R. Webster. Premises on the east side of Orchard Street.

Description.

Fixture.	Pattern.	Waste.		Size Trap.	Vent.		Remarks.
		Size Inches.	Weight per Foot.		Size Inches.	Weight per Foot.	
Water closet....	1 Sanitary. ...	4	Lead bend	4	2	lbs. 3½	All in accordance with rules and regulations.
Earl tub	1 Copper, 14 oz..	1½	.....	.....	1½	2¾
Wash bowl.....	1 Marble	1½	.....	1½	1¼	2½
	One not enclosed with wainscotting.						
Kitchen sink ...	1 Cast iron	1½	.....	1½	1¼	2¾
Slop hopper ....	.....	.....	.....	.....	.....	.....
Urinals .....	.....	.....	.....	.....	.....	.....
Fixed wash tubs.	
Fixed wash trays.	.....	.....	.....	.....	.....	.....
Soil pipe	4 Cast iron.....	.....	.....	None...	Through roof.	

The health history of each house in the town ought theoretically to be kept with these plans, but as this would belong to the department of the Medical Health Officer it would not be difficult under a proper system for a person wishing to buy or rent a house to get complete information regarding it from both departments.

DISPOSAL OF SEWAGE.

This subject very naturally becomes of interest in connection with the development of all sewerage systems, whether separate or combined. Advantageous as the separate system of sewerage is, it certainly, were the great advantage of rapid delivery not on its side, does pour forth its sewage in a more concentrated form than the latter; and if this delivery should be into a small stream, the nuisance resulting from such a method of disposal would be of a serious character.

In this Province, with its system of inland lakes, situated upon the shores of which are our largest cities, the dangers associated hitherto with the disposal of sewage by pouring it into these waters have not been great; but their increased use as sources of water supply, the rapidly increasing population and the construction of sewerage systems in many towns, all demand that the question receive careful consideration on the part of health authorities. That this is being done to some extent may be gathered from the schemes which, under Section 30 of the Public Health Act, 1887, have been submitted for the consideration of your Board; and by the various propositions which are at present being made to Toronto, London, etc., for solutions of the problems they have respectively to deal with.

As frequently remarked in reports and pamphlets already issued by the Board, there are three ordinary methods for disposal of sewage, and each of them to-day has its special advocates, while almost every sanitarian is agreed that according to circumstances each may be suited to its own particular case. Thus, as things are at present constituted, with a comparatively small population, an uneven surface and a rocky soil in and around Brockville, while past the town flows the St. Lawrence, with an enormous volume of water, to the rapids below, and no town very near, the pouring of its sewage into deep water in the river below the town was a proper disposal. On the other hand, with currents westward at times and no notable eastward movement of the waters of the lake, it becomes a grave question to decide whether Toronto, in her own interests, can pour sewage into the lake to the west of Scarboro' Heights and at the same time pump her water supply from outside the Island. London again is confronted with an injunction restraining her from pouring her sewage into the Thames, a small stream on the banks of which suburban residents are subject to the effluvia from the shores during the low water of the later summer months. We have in such cases to enquire whether one or other of the two methods left at our disposal can be utilized with advantage in these and the numerous other cases which in coming years will, in Ontario, demand consideration.

Already, in one instance, has it been attempted to solve the problem of disposing of the sewage upon the land, by laying out at the Asylum for the Insane, London, a sewage farm with the various structural accessories necessary to it. The following details of the farm are a matter of some interest, and as they have been submitted to and approved of by the Board, they may be of interest in this connection.

The following extracts are taken from Col. G. Waring's report to the Department of Public Works. Having referred to necessary improvements in the plumbing and the carrying of the various drains to the main sewer from the buildings, he says:

(1) At the head of this drain and outside of the building, there should be placed a fresh-water flush-tank with a discharging capacity of 150 gallons, which should be supplied with water by a small stream sufficient to fill it once or twice in twenty-four hours. When filled to the overflow point it will discharge its contents rapidly and flush the six-inch drain leading from it to the main tank. In this case, as in all others, the vertical soil pipe, or connections, must be so vented that the flood of water delivered through the sewer by the flush-tank, cannot draw the water out of their traps. Where ventilation is not now carried above the roof of the building, traps may be protected by the use of McClellan's mercury seal trap, made by the Dubois Trap Co., of New York city.

This is easier and more cheaply applied than continuous vent pipes, and is at least equally effective. At this point all of the fixtures should be carried to one outlet instead of having two, as now.

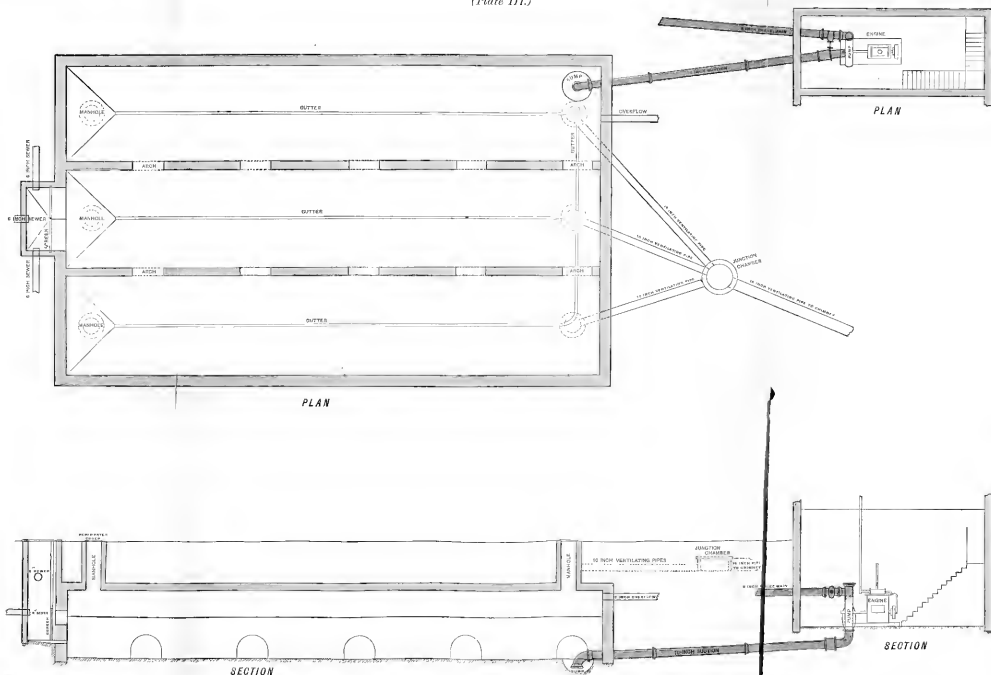
(Plate IV.)





COLLECTING TANK AND PUMP HOUSE

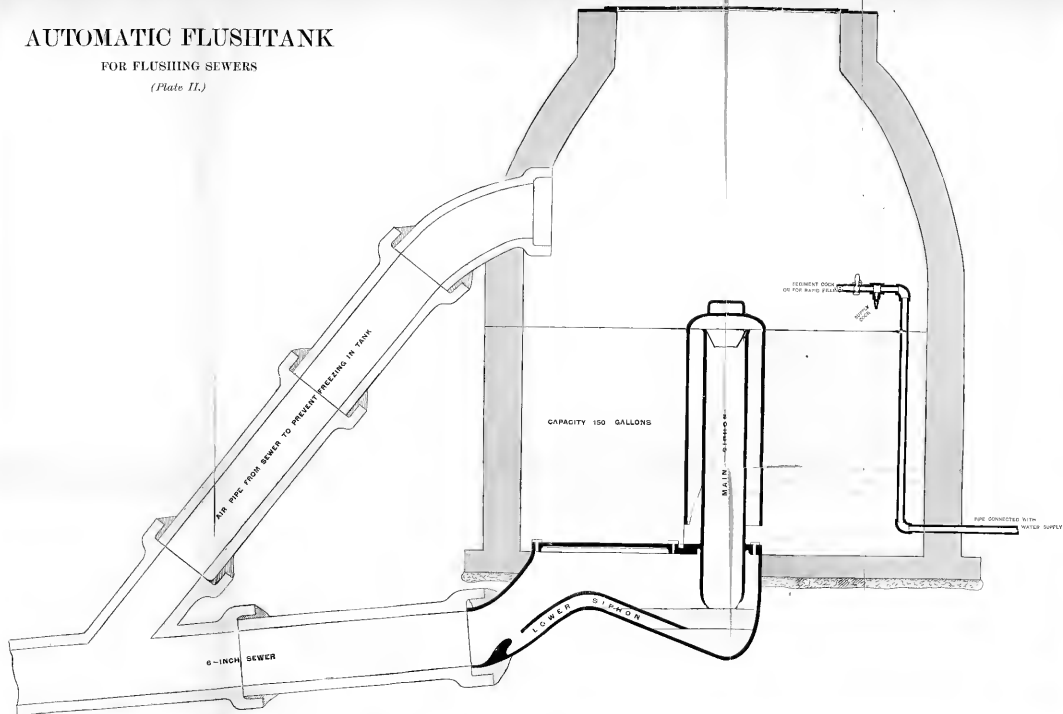
(Plate III.)



AUTOMATIC FLUSH TANK

FOR FLUSHING SEWERS

(Plate II.)



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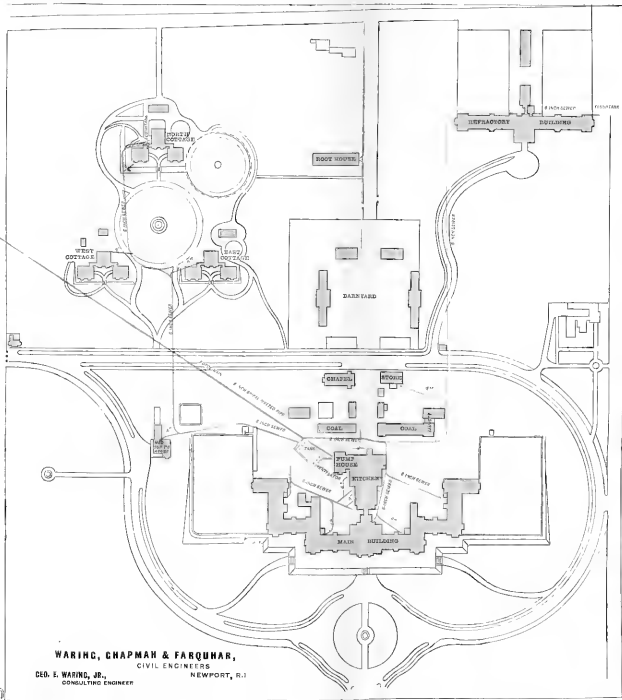
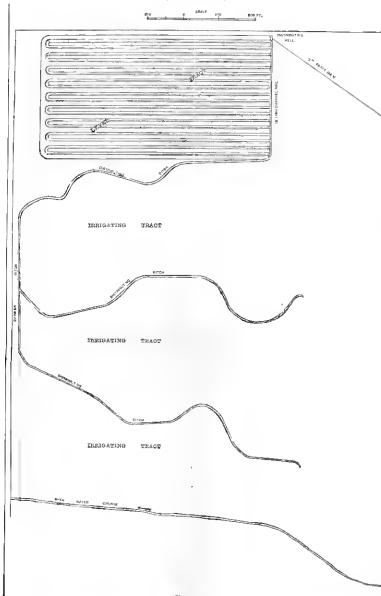
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ASYLUM FOR THE INSANE,
LONDON, ONT.

(PLATE I.)



In laying the new drains beyond the length of iron pipe passing through the foundation, only the best vitrified drain pipe of true form should be used, great care being taken that the sockets are in all cases large enough to admit of a quarter-inch gasket of oakum to be driven to the bottom of the joint. This gasketing being well driven home, mortar made of one part of cement and one part of sand should be firmly pressed into the joint, rubber mittens being used instead of a trowel. When the joint is full it should be smoothly bevelled in the angle between the socket and the pipe.

Pipes should be laid on their full beds, the bottom being dug out to give room to the sockets.

The filling should be carefully packed at the sides of the trench to the height of the middle of the pipe, great care being taken not to displace the pipes and open the joints. The next foot of filling should be of fine material, carefully put in place and lightly rammed. From this point up the earth should be well rammed to the top.

With a pipe of this size there are objections to the use of manholes. I recommend in their stead the use of oblique inspection pipes, set in pairs at intervals of about 300 feet. The castings for these can be procured from the Dececo Company, Newport, R. I. The cost will be somewhat less than the cost of manholes. The plan of the buildings and of the grounds indicates the location, arrangement and size of the present drains, which are used for the removal of foul wastes and of storm water. I advise that these drains remain unchanged, except so far as is necessary to cut off the connection between them and all sources of foul sewage, leaving them to continue their present service so far as the removal of storm water is concerned. These are the drains indicated on the plan submitted to me. The plan sent herewith shews in red lines the new drains recommended for the collection and removal of foul wastes. These all lead to an underground tank, to be constructed, as shewn, to the rear of the west wing of the main building.

The details of this tank are shewn in the drawings. Its interior size is 70 feet by 40 feet. Its walls are 16 inches thick. Its bottom is of concrete. It is covered by three longitudinal arches, 12.66 feet span, 12 inches thick. These arches rest on two longitudinal walls with arched openings. The floor of the tank is graded as shewn, varying between elevation 31.9 and 32.3 respectively. Each section has a longitudinal drainage gutter, with its upper end at 32.22 and its lower end at 31.98, 31.94, 31.90, with a cross gutter leading to a sump four feet in diameter with its bottom at grade 30.0.

The bottom of this sump is hemispherical, and the suction pipe of the pump is centrally located, having six inches space between its mouth and the bottom. This mouth should be bell-shaped, not straight as shewn in the drawing.

The elevation of the ground at this point is 47.5, making the surface of the floor of the tank about 15 feet below the surface.

There are three manholes at each end of the tank, with covers at the surface of the ground. At the receiving end of the tank, at the head of the central chamber, is a screening chamber reaching to the surface of the ground and with its bottom at elevation 34.4.

The opening from this chamber into the tank is 8.33 feet wide, and it is provided with a screen carried in slots in the side walls 4.5 feet high in the centre. This screen is to be made of wrought iron and galvanized. The vertical bars to be of half-inch round iron, and the openings between them one inch wide. The top of this screening chamber is covered at the surface of the ground with a hinged wooden cover. The plan of the tank shows iron tie rods at 10 feet intervals.

These will not be needed if, as is probable, the earth will afford a sufficiently firm support for the walls to prevent spreading from the weight of the arches before the filling becomes firm.

As shown in the drawing, there are three lines of drains entering the screening chamber. The one leading from the Superintendent's house enters at grade 36.3, while those from the outer buildings enter at grade 43.0.

It is intended that the tank shall be filled to a depth of five feet, or to the spring of the arches. Its capacity to this point is a little more than 100,000 gallons. The precise location of the pump is not fixed. It is to be placed wherever the architect shall find it most convenient in connection with other work, but it is assumed that it will be about 60 feet east from the sump corner of the chamber. This pump is to be placed in a pit having its bottom at grade (?) It is a six-inch Webber rotary pump with a ten-inch suction, and with a force main leading to the north-east corner of the north field. This force main is ten inches in diameter and 2,500 feet long.

Near the pump chamber, as shewn, this force main has a branch eight inches in diameter leading to the receiving well of the west absorption field, a distance of 1,550 feet.

I recommend for these force mains "Spiral Weld" steel pipé, with an impermeable coating.

The eight-inch force main has a gate near its connection with the ten-inch main, to be closed when it is desired to pump to the north field. When the gate is open the whole flow will pass through the eight-inch main, which delivers at much less elevation than the ten-inch.

It is assumed that the tank will hold one day's sewage. It is not very material whether it is somewhat more or less.

As the levels have not been received for the north field, I am sending now only the arrangement for sewage disposal on the west field, which has an available area of about 30 acres. This arrangement is shewn in the drawings.

The receiving well at the point shewn is to be constructed as shewn in the drawings.

Its inlet is at the bottom, and the force main has a continuous rise from the pump. The pump has no valve. Therefore, whenever the pump is stopped the contents of the receiving well and force main will flow back into the tank, so that there will be no trouble from freezing.

At the highest part of the field, a tract, occupied in the drawing by parallel red lines, west and south of the receiving well, is brought to an absolute level at an elevation of about 45.8.

This level tract is laid off in communicating parallel ditches as shewn by the red lines, and is underdrained as shewn by the blue lines. The main outlet from the receiving well has a fall of one in 500. At its lower end it delivers into a distributing ditch, which is continued by a carrier parallel with the west side of the field, from which carrier two distributing ditches, BB and CC, are laid, as shewn.

The carrier ditch has the natural fall of the land, the distributing ditches have a fall of one in 500. At a point south-east from the level field there is a short level catch ditch, "AA," intended to intercept the surface flow of sewage down the steep slope near it, and distribute more evenly over the depression below. The need for the catch ditch may be avoided by such grading at this part of the tract as will bring the contours more nearly parallel. The drawings show the details of construction of the details of the irrigation field.

The main outlet from the receiving well is to be made of half pipes (vitrified). This pipe is to be without sockets, and is to be laid in vitrified collars, or sleeves, as shewn.

The pipes may be laid an inch apart. They are depressed six inches below the general surface of the ground, the earth being sloped back from the inside of the pipe, as shewn in the section.

At the end of each of the parallel ditches, connection with the main outlet channel is made by a concrete branch piece, constructed as shewn in the plan. It would be difficult to secure half branch pieces of vitrified pipe.

The concrete should be made with the best Portland cement, and should be thoroughly hardened before frost, and well hardened before the laying of the vitrified connections. The gate slots shewn in the plan of the main outlet are one and-a-half inch spaces between the half pipes and the concrete branch pieces. They are to be furnished with movable iron or wooden gates, by placing and removing which the flow of sewage can be directed at pleasure into all or any of the parallel ditches. The connection between the concrete branch pieces and the ditches, is made with two lengths of vitrified pipe (four feet). As the bottoms of the ditches are all in the same plane, and as the main outlet has a fall, there will be a drop of varying height from the half pipes into the ditches. At this point, and even where the drop runs out at the lower ditch, the bottom of the ditch should be roughly but strongly paved, as shewn, to check the flow and prevent the cutting of the bottom at that point. The relation between the half pipe and the ditch is shewn in the "Section of Settling Ditch." These ditches are eight feet wide at the top, two feet wide at the bottom, and one-and-a-half feet deep. They are separated by beds ten feet wide at the surface. This level area with its settling ditches may be used for intermittent downward filtration, and as the total capacity of the ditches is equal to twice the capacity of the tank, even were there no immediate filtration, the area could be worked in two sections alternatively. Making allowance for filtration during pumping, it probably can be worked alternatively in three areas. Two or four of these ditches at the lower side of the field may be used, if found necessary, as settling ditches to deposit heavy matters before delivering the liquid over the surface of the irrigation tract below.

It will make little difference, so far as the delivery by the distributing ditches is concerned, whether the sewage runs through the parallel lines or not. Its final delivery will be from the end of the main outlet into the head of the upper distributing ditch.

The section of the distributing ditch should be about as shewn in the drawing of the "Section of Carrier and Distributing Ditches," which are four-and-a-half feet wide and one foot deep.

If the flow through the distributing ditch is arrested at any point, as it may be by sticking a wrought iron gate into the earth, making a dam across the top, the sewage will overflow for a greater or less distance above the dam, according to the volume of the current. If the dam is placed first at the lower end of the upper distributing ditch it will overflow, for example, 200 feet above the dam. When the ground to be reached by this overflow has received a sufficient supply of sewage, the dam is placed higher up stream, and the overflow carried over the next section of 200 feet, and then, in like manner, to the third section. Should the ground between the two ditches not be able to absorb all the sewage discharged upon it, the overflow will be caught by the second distributing ditch, BB, and if its quantity is sufficient can have its distribution regulated by the placing of a dam there as above.

It is probable that in ordinary conditions of the soil there will not be much passage of sewage from one ditch to another unless from the west end of BB, to that end of CC. It would, of course, be possible to regulate this distribution more exactly by bringing the whole field to a careful grade, but I think a satisfactory result will be obtained without going to this outlay.

At the lower end of the field, shewn by a black line, is a ditch for the removal of any excess of sewage that may reach that point. It is not likely that there will be any considerable flow to this line, and when it is reached it will have been thoroughly clarified by passing over the ground.

The main outlet is 400 feet long; settling ditches have an aggregate length of 3,600 feet; the carrier and distributing ditches have an aggregate length of 3,100 feet, and the tile drains aggregate 6,600 feet. The outlet to the underdrainage six-inch tile is to be six feet deep at the end of the upper bed, six-and-a-half feet deep at the lower bed. The lateral drains are to be four-inch tile for the lower half, and three-inch tile for the upper half. The upper ends of these laterals are to be four feet below the surface of the beds, and they are to be carried on a true grade to the six-inch outlet pipe.

In excavating for the tank, cut first a trench five feet wide, having its outer side on the exact line of the walls, carrying the trench to grade 31.0. This will allow the bank to be braced if it has a tendency to cave. If the bank stands straight, the brick-work can be built directly against it, the small voids being filled with concrete. If the caving is considerable the walls should be built true and the voids filled with sand thoroughly rammed, *after the wall has set firm*.

I assume that no specifications for the brickwork are needed in your case, but I suggest that only the best Portland cement be used in the proportion of at least one of cement to two of sand.

Great care should be taken that every brick is fully bedded in cement, on the sides, beds and ends. The walls should stand on a concrete footing, to be afterwards continued as the floor of the tank.

The gutters for the drainage of the floor may be moulded in the concrete. After the work is finished, the whole floor, walls and arch, should be smoothly rendered with a skin of neat Portland cement.

The ventilation of this tank will be in connection with the manholes, probably also in connection with the chimney-stack. Details for this will be sent later.

The following report on Col. Waring's plans expresses the Board's view of this matter:

PROVINCIAL BOARD OF HEALTH, ONTARIO,
TORONTO, September 12th 1888.

To the Chairman and Members of the Provincial Board of Health:

GENTLEMEN,—Your committee having received, along with a communication from Dr. W. T. O'Reilly, the Inspector of Public Institutions, the plans for the proposed construction of a system of irrigation for disposing of the sewage of the London Asylum, begs leave to report thereon as follows:—

1. That it gives your committee especial pleasure to view the efforts which have been made by the Ministers of the Departments having charge of Public Institutions and Public Works, and by their deputies, for the solution of the difficult problem of the disposal of the sewage of one of our largest public institutions in such a manner as is in keeping both with the law against the pollution of streams and with those more modern scientific methods which, from time to time, have been recommended for adoption by this Board to different towns and cities in the Province. It is only proper that the Government should be the first in the Province to undertake the system of disposal of sewage on land by a method which, however successful it may have been

elsewhere, must still be considered an experiment in Canada, since, if successful, it will serve as an object lesson and educating medium to our many municipalities which have to deal with similar questions; while, if but a partial success, it will still have been an expenditure incurred in the interests, presumably, of the whole Province.

2. Your committee would concur most heartily in the preliminary observations of Col. Waring to the effect that it is essential to any fair test of the proposed system of sewage disposal, that the house drains and plumbing throughout should be of such a character as to make impossible of occurrence therefrom any evil results (such as outbreaks of typhoid fever, diphtheria, etc.,) which might be unjustly charged to the sewage farm; and your committee would further add that the improvements in the plumbing proposed are of such a modern nature (examined without any special knowledge of the building) viewed generally, as to commend themselves almost without exception to your committee.

3. Your committee, not presuming to pass judgment on the work of so eminent an engineer as regards the details and construction of receiving tank, pumping mains, and the many other questions of a mechanical nature in connection with the proposed system, assumes them to be, as they are as far as our observation and reading have gone, of a character fully abreast of all modern work in this field.

4. The question of how best to utilize or finally dispose of the sewage when arrived at the receiving tank has been one of much difficulty everywhere, as is fully set forth in the following reports:

1st. The report of a committee appointed by the Local Government Board (Great Britain) to inquire into the several modes of treating town sewage, 1876.

2nd. The purification of water carried sewage by Robinson & Melliss, member Ins. C. E., Eng., 1877.

3rd. Sir R. Rawlinson's plans for main sewage, drainage and water supply, 1878.

4th. Commission technique de L'assainissement de Paris, 1883.

5th. S. M. Gray's report on proposed plan for a sewerage system for City of Providence, R.I., 1884.

6th. Recent reports from various papers and journals *re* irrigation farms at Gennevilliers, Berlin, Coventry, Pullman, etc.

Some of the conclusions your committee would gather from these reports are:

1st. That the character of the sewage of different towns as regards its contents and dilution alters somewhat the difficulties of preventing a nuisance when the sewage is poured upon the land.

2nd. That the dangers of a nuisance are increased or minimized by the particular method of irrigation adopted.

3rd. That broad irrigation without underground drainage does create a nuisance in heavy soils. (See Robinson & Melliss, p. 99, etc., etc.)

4th. That raw sewage can be poured on an open, gravelly soil without creating a nuisance. (See Rawlinson, p. 18.)

5th. That the method proposed in the combined broad and flat-bed scheme of Waring is likely to prove, with flat-bed subsoil drainage, that careful and intelligent supervision will enable the farm to be carried on practically without nuisance.

Thus says Prous before the French Commission:—

"It is necessary to maintain the greatest possible aeration of the soil, to distribute water regularly, that is, in even quantities and equal intervals of time, in such a way that its descent through the soil lasts at least the time desired for its purification; to take, when necessary, measures for drawing off water from the soil (sub-soil drainage). In a word, never to allow it to accumulate in the soil." Brouardel, however, in his examination before this Commission, was not absolutely certain that injury might not come from infectious particles being lifted into the air from the sewage fields, and is supported in his fears of possible trouble by Pasteur, Frankland, etc.

Durand Claye, the Engineer of Gennevilliers, states that the statistics proved that with typhoid epidemic in Paris in 1883, there were during the same year only two cases of typhoid in the commune of Gennevilliers (and they were imported from Paris) in which the great sewage farm is.

6th. Speaking for ourselves, after a careful review of the biological facts which form so prominent a part of the question of sewage farms, we would say that the sources of possible

danger pointed out by Pasteur being due to the development of bacteria during the putrefying processes which the sewage undergoes, with the subsequent transportation by winds of said bacteria from the surface of the soil when it becomes dry (as is the case with the germs of malaria or ague from drying marshes) can, we believe, in a large degree be obviated :

(a) By the green crops, such as rye grass, which are found to do best on the broad irrigation surfaces, *i. e.*, between the distributing drains A, B, etc., preventing the rise of bacteria, at times possibly pathogenic, into the air.

(b) By preventing (as in depressions of the ground) accumulations of sewage—forming putrefactive centres : and by not allowing in the furrows of the flat-bed system either accumulations of sewage on the one hand or the drying out of putrefied sewage on the other.

(c) We would further say that we feel free to recommend the adoption of the system since, should it be found in the future that surface irrigation cannot be carried on without producing a nuisance, it will be very easy to so arrange at the irrigation field for settling tanks, from which the clarified sewage can be distributed in the same manner as now contemplated, or by shallow sub-soil field tile drainage. The sludge from the tanks could then be readily carted away and ploughed under at once.

4. Regarding the important question of whether the effluent from the sub-soil drains can with safety be turned into Carling's creek, your committee would remark that the water from such sewage farms is found both in England, France and Germany to be practically pure water, Durand Claye stating before the Paris Commission that there were not more than sixty-seven bacteria per cubic centimetre in that from the Gennevilliers farm, and that it contained fewer than the water of the River Vanne, supplying Paris. A member of your committee has found in well water ninety-seven bacteria per cubic centimetre.

The published report of the Provincial Board for 1887, under the heading "Public Water Supplies," points out most of the known facts on the bacteriology of the soil, from which it is apparent that the soil a few feet below the surface contains few bacteria, the deeper strata not favouring their multiplication through absence both of organic matter and air.

In conclusion your committee would strongly support the proposed scheme.

All of which is respectfully submitted.

J. D. MACDONALD,
H. M. MACKAY,
PETER H. BRYCE,

Members of Committee on Sewerage and Water Supplies.

This scheme, as proposed by Col. Waring, is the same in principle as that adopted at Pullman, Illinois, and described fully by Dr. W. Oldright in the Board's Report for 1887. Its engineering details and methods of subsoil drainage are those which the conditions seem to have indicated. Manifestly, should the management of this farm be carried out with careful attention to details, it will become a model for those towns which have the work of disposal of sewage under consideration. While at Gennevilliers, below Paris, France, at Berlin, in Germany, and other places, these farms have not been instituted primarily from the standpoint of profit, yet there, as at Pullman, they have, in addition to solving the sewage problem, paid a small interest on the capital invested.

Remaining for our consideration is the precipitation method of disposal. Manifestly this scheme appears at the outset cumbrous and expensive, assuming as it does the dealing specially with the daily sewage of cities, in some cases amounting to many millions of gallons.

It has not yet been found possible for the London Metropolitan Commissioners to summon up enough courage to deal with the enormous quantity of London sewage by either the sewage farm or precipitation method. Its main features are, however, the throwing down of the coagulable albuminoid portions of the sewage, after the settling of the heavier solid matters, as refuse of all kinds and sand, which find their way into the sewage by precipitants such as lime, alum, etc.

Where combined systems of sewerage exist, as in the cities and towns of England, this method is of great value, inasmuch as it supplies in the supernatant water drawn off from the precipitation tanks the ammonia and other alkaline salts with the soluble phosphoric acid compounds in such a state that they can rapidly filter through the soil of a sewage farm without creating any nuisance.

The method is annually becoming more generally adopted whereby the precipitate or sludge is compressed into cakes by filter presses such as that made by Messrs. S. H. Johnston & Co., Stratford, England, and so dried thereby that it can be readily transported in blocks for commercial purposes. To illustrate the great advantage of this method, it may be stated that while the precipitated solids form but one-tenth part of the sludge after running into filter presses they form one-half of the contents of the pressed cake. The bulk of the sludge is thus reduced to one-fifth that of the initial sludge. With the perfecting of the mechanism of these presses and their more general use, their price may now be considered to be within the reach of every municipality which needs to adopt them.

From these illustrations it becomes apparent that methods exist, even if costly, whereby the sewage may be safely disposed of apart from that now so generally adopted of pouring it into the neighbouring stream or lake. As already remarked, the great point is for municipalities to decide on that method which leaves its own and other water supplies unpolluted. In the case of Toronto, two consulting engineers, Messrs. Rudolf Hering and Samuel M. Gray from the United States, have been engaged in reviewing the work and propositions which three years ago were submitted by Messrs. McAlpin and Tully for the extension of her public water supply and for disposing of the enormous volume of sewage now poured into the bay. They have practically confirmed the conclusions already arrived at, viz., that it will be perfectly safe, as it is the most economical method, to pour the sewage into the lake near Victoria Park.

The following is quoted from their report :—

“ But, with a sewage discharge near Victoria Park, several thousand feet from shore, it is possible to draw the water from the present intake opposite the Island and to allow a distance for dispersion of sewage of about six and one-half miles. The total cost of disposing of it in this way is estimated at \$1,471,048.00, which makes this project nearly half a million dollars less expensive than the other one, and has a further advantage in greatly facilitating an immediate increase of the present supply, as mentioned above.

We have no fear that by the westerly movement of the littoral drift the sludge will be carried far towards the Island, before the bed of the lake will show its entire disappearance. Nor, if the sewage is passed through a strainer, having an inch mesh, do we think that objectionable floating matter will be found stranded along the near shore. The proposed improvement of the eastern entrance to the harbor and the proposed outlet of the river Don at the eastern end of Ashbridge's Bay will aid in dispersing the sewage matter by deflecting or breaking the current when it moves towards the Island.

The intake being in deep water near the bottom where the current is slight, is a further protection, because whatever matter might accidentally have drifted to so great a distance, would most probably be near the surface and not in the more quiet current near the bottom.

As already stated, however, we are willing to admit the possible advisability of clarifying at least some of the sewage in the future, when the city has trebled its present population. Whatever is herein recommended will not interfere with ultimately adding works for this purpose, but will really form a necessary part thereof.

For the above reasons we believe that it is safe to locate the sewage outfall opposite Victoria Park, in thirty feet of water, at least two thousand feet from shore, and being also the most economical project, we believe it to be the proper one for the city to adopt. This outfall was suggested in the city engineer's report of November, 1886.”

The reasoning by which these conclusions are arrived at is contained in the following statements :—

“ The available localities for a sewage discharge depend upon the points from where the water supply is drawn, which, as we advised above, should be taken from Lake Ontario. The fact of drinking water coming from the same lake into which we discharge sewage, should not necessarily disturb us, any more than breathing the same air into which we continually exhale the discarded gases and other effete matter from our lungs.

The objection to such pollution is mainly one of degree. If we have a high degree of dilution, in the first case with pure water and in the second with pure air, we have yet to discover the slightest evidence that any harm has resulted. The gradual self-purification of polluted water and air by means of oxidation, through the excess oxygen contained in the dilut-

ing medium, is an established fact, and is nature's method of correcting what would otherwise be a serious evil. For our purpose it is a question of degree of dilution, and in both cases we have enough experience to approximately indicate safe limits.

The regular and constant current of rivers enables us to fix this limit with greater exactness than when the sewage is discharged into a large body of water, such as Lake Ontario, in which the currents move in almost any direction or sometimes are quite imperceptible. Still, it is not difficult to reach some conclusions in this case.

If the sewage is discharged into the lake in deep water near the bottom, we are safe in concluding that the *sludge*, i. e. the heavier matter, will very soon settle and no longer be contained in the water a few thousand feet, perhaps a mile, distant. At long intervals dredging can easily and cheaply remove any large accumulation at the outfall. The lighter and fatty ingredients of the sewage and those which are held up by attached bubbles of gas, rise to the surface and are moved along by the current, thus constituting the chief danger. Both in rising and subsequently in their horizontal movement, they are separated and dispersed along the cycloidal paths travelled by particles of flowing water. One cubic foot of sewage discharged into a current of 100 cubic feet of water per second, would gradually become diffused throughout this quantity and diluted a hundred times. While becoming more and more exposed to purification by the oxygen in the water, the deleterious matter would gradually be reduced to a point beyond detection. The higher temperature of sewage as compared with lake water, will not, we think, be an important factor in dispersion, because the flow for several thousand feet in a submerged steel pipe will tend to equalize the temperature and materially reduce that of the sewage before its discharge.

Nothing but actual tests, however, will tell us how rapidly diffusion and oxidation take place and therefore how far apart we should have the sewage outfall and water intake. The season was unfavorable to make many experiments in this direction. But from general experience gained upon the lakes and elsewhere, together with the results of a few recent local observations, we believe to be justified in drawing some conclusions."

After the remarkable conclusions so readily arrived at in the preceding quotation we find the following:—

"The float observations made in the lakes do not indicate any marked difference in the frequency of the currents in one direction or in the other. Nor is it of much value for our purpose to know this difference. The fact that they move both east and west is enough to indicate that the sewage should be discharged sufficiently far away so that the unfavorable current, if only occurring once a year, will not cause the water near the intake for the city's supply to be polluted."

The last statement appears to us the only essential in the whole question, and we do not feel that we have sufficient data given anywhere which would lead us to suppose the danger therein stated is to be obviated by the proposed scheme.

On the assumption made in the report that the currents may reach a velocity of 100 feet per minute, we would have sewage moving at times at the rate of one mile an hour at least, or in six or seven it could be borne to the mouth of the water-pipe. Remembering that the scheme proposes to deal with 40,000,000 imperial gallons of daily discharge from a population of 500,000, the question which presents itself is this. With an easterly wind causing a movement of water toward the in-take pipe, can we suppose that this amount of sewage, which, according to the same gentleman, would require 5,000 acres or nearly three miles square of land to remove from it the impurities by filtration through the soil, would disappear and leave no vestige of its presence during an onward movement of six or seven hours? In the quotation made we have the statement that the objection to such pollution is mainly one of *degree*. It can hardly have been intended that we are to believe that oxidation of the sewage during these few hours can have taken place in the cold lake water to such an extent as to make it an argument in favor of the scheme, and it may fairly be said that without more scientific reasons than have been given in the report, the *degree* of the "objection to such pollution" is such as to prevent any such scheme from meeting with general approval.

I have the honor to be,

Your obedient servant,

PETER H. BRYCE,
Secretary.

REPORT OF THE COMMITTEE ON SCHOOL HYGIENE.

To the Chairman and Members of the Provincial Board of Health :

GENTLEMEN,—Your Committee beg leave to report upon the following memorial which has been referred to this board by “the Honorable the Minister of Education,” in pursuance of a recommendation from “the Committee on Sanitary Provisions for Public Schools of the Conference of Public School Inspectors.”

The memorial reads as follows, viz.—

To the Honourable Minister of Education :

SIR.—Your Committee on sanitary provisions for public schools recommend, t^l at there be provided a circular for distribution to School Boards, urging upon them the special necessity of complying with Regulations, Nos. 1, 2, and 3, of the Public Schools Act of 1887. Your Committee further recommend, that the said circular should give very definite directions upon the following points ;—

1. The construction and arrangement of privies should receive especially careful attention.
2. The situation, lighting, heating and ventilation of new school houses.
3. The means of providing efficient heating and ventilation in existing school houses.

(Signed.) WILMOT M. NICHOLS.

Owing to the unsatisfactory means provided for the thorough ventilation of a large number of school houses, in rural sections—in addition to the very imperfect construction of the out-houses erected on school sites—your committee believe that many preventable diseases now so prevalent—especially typhoid fever and diphtheria can, by the proper observance of sanitary laws, be almost “stamped out,” and recommend, that circulars should be prepared by the Provincial Board of Health for distribution among school trustees and municipal officers, with the object of pointing out to them the dangers to which both pupils and teachers are exposed from the causes mentioned, and the imperative need existing for their removal.

(Signed.) WILMOT M. NICHOLS,
Chairman of Committee on School Sanitation.

There are two very common causes of disease referred to in the memorial, viz :—

1. Pollution of soil ; and
2. Insufficient ventilation.

Wherever one or both of these conditions exist disease germs find a congenial soil upon which to live and rapidly increase.

The extraordinary vitality of typhoid and diphtheria germs, for a long period after they have passed out of the body, under the influence of conditions favorable to their growth and reproduction, has been repeatedly proved by innumerable facts in the history of these diseases. The conditions requisite for their reproduction are decomposing animal matter, human excreta, warmth and moisture. Hence, ill-ventilated, filthy schoolrooms, cesspools, privy-pits, often containing the accumulations of years, badly constructed drains and damp unventilated cellars should be strictly prohibited, in connection with our school accommodation.

Typhoid fever while sometimes communicated by the air, is peculiarly liable to be transmitted by means of water. Great care should therefore be taken by trustees to secure for their schools a water supply which shall be thoroughly free from all pollution of the soil, more particularly that arising from the specific poison which is contained in the discharges from the bowels of patients suffering with this disease.

Diphtheria is most commonly disseminated by means of the atmosphere. The special contagion of this disease remains virulent for a great length of time, and may be carried a considerable distance on the person or clothing without losing its activity

The attendance of pupils coming from houses where diphtheria is known to prevail should be strictly prohibited, until they are provided with a proper medical certificate stating that they are no longer capable of communicating the disease to others.

Dirty floors and badly ventilated school-rooms contribute to the spread of consumption, more especially where the expectoration of persons afflicted with this disease is allowed to remain and become dry on the floors. Under these circumstances (as pointed out in the report presented by Dr. Cassidy, at the Lindsay convention, August 14th, 1888,) the bacilli of tuberculosis rise with the dust, and enter the respiratory passages to be introduced into the circulation. Thus, this dread disease, which heads the list in the rate of mortality in Ontario, causing about 12 per cent. of our annual death-rate, may be propagated in the air of the school-room.

In proof of this we may repeat the statement contained in our health bulletin for June and July. The eminent Prof. Esmarch, of Germany, as have others, has recently found that by using a sponge dipped in glycerine, which has been previously cleansed and sterilized, and then wiping down the walls of rooms, as in hospitals, etc., he obtained colonies of bacteria varying from 6,391 to 17 colonies to the 25 square centimetres. Their number varied with the character of the wall covering, whether paint, varnish, paper, etc., and upon the position and character of the particular room. There were fewer in the upper than in the lower parts of the room,

Prof. Carnelley has shewn further, that stamping for a moment on the floor of a room, such as a school-room, raises into the air almost innumerable microbes. Winds act similarly in increasing the number of microbes in the air.

In view of all the circumstances, and the imperative necessity of immediate action your committee would recommend that the following instructions be issued from the Education Department:—

1. School Trustees shall, in every case, avail themselves of the services of the Medical Health Officer, in accordance with section 113—schedule A—sub-section 1 of the Public Health Act of Ontario—constituting this officer Medical Inspector of Schools, and Advisory Officer in School Hygiene.

CLOSETS, ETC.

2. All privy-pits. shall be cleaned out, disinfected and filled in with fresh clean earth.

3. In towns provided with sewers, properly constructed water closets and urinals shall be provided, preference being given to closets which are automatic in the action, and supplied with a good system of flushing.

4. The Smead and Dowd system of dry air closets in connection with their system of heating and ventilation, has been found to work well in practice, and is well worthy of adoption.

5. When the above mentioned systems are not used, earth closets shall be constructed.

6. The construction of earth closets may be varied to suit circumstances, but the following general principles must be observed, viz.—

(a) An apartment provided with a suitable seat, and a pail or water-tight box for excreta—the box to have handles for convenience of handling. In large schools, however, a shallow water-tight brick vault may be used instead of the excrement pail or box, precautions being taken to have earth, ashes or sawdust scattered over the excreta every day; the vault should be emptied at frequent intervals under the direction of the trustees.

(b) Behind the first apartment is a second one (see diagram) in which is placed a dry earth receptacle—a rectangular shaped box is preferable; a barrel or half barrel may serve the purpose however.

(c) The first mentioned apartment to have a hinged opening or removable board behind the seat, so constructed as to admit of easy access, for the purpose of throwing dry earth, coal, or wood ashes, or sawdust on the excreta, with a small scoop or shovel.

(d) Ventilating pipes should be constructed in connection with these apartments, as also in connection with the brick vault.

The following diagram represents a single apartment, with its adjoining dry earth enclosure. When required any number of these may be constructed together.

(e) (a) seat ; (b) excrement-box ; (c) hinged opening, raised in order to throw in dry earth ; (d) dry earth receptacle ; (e-e) ventilating pipes.

(f) For deodorizing purposes moulds or loams are preferable ; pure sand is valueless clay is not easily pulverized, and is retentive of moisture.

(g) Dry wood or coal ashes or sawdust may be used, if loamy soil is not easily procurable.

(h) The earth should be properly prepared. For this purpose suitable sheds for drying and storing it should be constructed on the school grounds. Provision should also be made for screening the earth in order to remove all lumps.

(j) The earth or ashes, with the excreta, should, after use in the closets, be disposed of under direction of the Medical Health Officer or Local Board of Health at the expense of the School Board.

(k) The caretaker, or some person appointed for the purpose by the Trustees, should throw dry earth, ashes or sawdust in the excrement-boxes or vault every evening after school hours, and also every morning before eight o'clock. The earth should be evenly applied so as to cover all excrement exposed. This work to be done under the direction of the Trustees, and subject to the approval of the Medical Health Officer.

(l) Where there is no Medical Health Officer, the Local Board of Health or their officers may have access to the earth closets for the purpose of inspection.

(m) If properly managed in many localities the contents of the excrement-boxes may be disposed of as garden or field manure, no offensive odour accompanying their removal and use in this way.

THE DRINKING WATER.

7. The drinking water used by school children should be analysed from time to time, and if found impure its use should be immediately discontinued.

CLEANSING OF FLOORS, WALLS, SEATS, ETC.

8. We would especially urge scrubbing of the floors at least once a week. Sweeping should always be done at night, the floors having been first sprinkled ; and the seats and desks should be dusted with a damp cloth on the following morning.

The desks, seats and walls should be kept scrupulously clean, the latter being brushed down with a moist brush or cloth weekly.

In addition to this, we recommend that all cracks in the floors should be filled up with putty. The floors should also be soaked with boiling oil several times until they become hardened. Hardwood floors are preferable.

SITUATION, LIGHTING, HEATING AND VENTILATION.

9. *School Site.*—The school site should be carefully selected on ground dry, porous and easily drained. When the school building is constructed on a clay soil, tile drains should be made in order to secure a dry condition of the basement. No water should be allowed to accumulate or stand under the floors, and a free circulation of air should be constantly admitted under the floors. In buildings of two or more storeys air should freely circulate under each floor. The site should be selected with regard to the lighting

and heating of the school. A building facing the south or south-east has an advantage in this climate as to heating and lighting :—1st. As to heating ; because the prevailing winds in winter blow from west and north-west, and the south-east front is consequently preferable. 2nd. As to lighting ; because the light entering from either the north or south side is most uniform during the day.

LIGHTING.

10. School rooms should be lighted by windows placed on the left side of the pupils. They may be lighted from two sides, viz., from the left and behind the pupils. Light should never be admitted in front of the pupils, nor from two opposite sides. The windows should reach from within four feet of the floor very nearly to the ceiling. The ceiling should be about twelve feet high. The windows should be about three feet wide, and the size of the windows collectively should be about one-eighth of the floor space. They should be hung with pulleys so as to be easily lowered or raised from the bottom. The admission of light should be regulated by suitable blinds.

HEATING AND VENTILATION.

11. During the cold season all schools in Ontario should be heated by steam, hot water or air warmed by a furnace.

12. A regulated system of introducing pure air into the school room and withdrawing foul air should in all cases be secured.

13. The Smead & Dowd system of heating and ventilating is the best, as far as we know, at present in use for school rooms, both in summer and winter.

14. In existing school buildings which have been constructed without a regulated system of heating and ventilation, the following methods may be adopted :—

(a) An excavation should be made under the building for placing a furnace, and provided with a suitable fresh air inlet.

(b) Outlets for the removal of foul air should be provided in each school room, preference being given to those which are so heated as to create a strong upward draught.

(c) These outlets should, in every instance, be carried up to the outer air, and should be made smooth internally by being constructed or lined with galvanized iron, zinc, tin, plaster or tile pipe, and provided with weather caps.

(d) In warm weather, when fires are not required for heating purposes, the outlets should be heated by a small stove, coal oil lamp, or other suitable contrivance, in order to create an upward current.

15. Any system of heating and ventilation which does not provide for an abundant ingress of pure air and a complete escape of foul air, is useless for purposes of ventilation.

16. If over crowding is permitted in school rooms they cannot be properly ventilated.

(Sgd.) H. P. YEOMANS, M. D.
J. J. CASSIDY, M. D.

REPORT OF DR. COVERNTON ON QUARANTINE.

To the Members of the Provincial Board of Health.

GENTLEMEN,—A few prefatory remarks on the general work of our Board since its first establishment, six years ago, will not, I believe, be viewed by you as unconnected with the special task assigned to me of reporting on the quarantine regulations and provisions now in existence at the station at Grosse Isle. Briefly, then, the object of the Board at the period of its inauguration and at present date has been to obtain a knowledge of how far the Municipal Councils of our Province had provided for the general sanitation of the inhabitants under their jurisdiction, and more particularly as to the means employed for due inspection and enquiries into the vaccination of children and re-vaccination of adults, when epidemics of smallpox were threatened; of the general precautions taken for due preparedness against possible advent of cholera; of investigations into sources of typhoid; into problems of causes of diphtheria and of the spread of this disease, as also of typhoid and scarlatina by impurities in the milk supply, or contamination of soil or drinking water; of the modes employed against infection by agency of reliable germicides; of the nature of the system of drainage, general and local, about the house and outbuildings, and of sewerage and disposal of sewage.

Needless to say that the work involved has been no light labour; it has been summarised in monthly reports, and more extensively detailed in our five annual reports, in which, year by year, the methods employed for educating the masses of the people have been described and opportunity afforded the readers of the same of judging how far the work has progressed.

There is no want of conviction on the part of members of this Board that a vast deal yet remains to be accomplished, but we trust we have reason for the belief that at least something has been done in the way of protecting the inhabitants of our Province from avoidable causes of sickness, as also in arousing Municipal Councils to a sense of the absolute necessity for granting far more advanced financial assistance for the well-being of the people than usually in the past has been most grudgingly doled out, as also something more nearly approaching adequate remuneration for the Medical Health Officers and Sanitary Inspectors by them employed.

With these few prefatory remarks, I pass on to the report proper on "The Quarantine System as it now exists at Grosse Isle." In the report I had the honour of submitting at the last meeting of our Board, I described the well-adapted position of this island for the purpose to which it has been devoted for the last seventy years, the admirable state of efficiency which Dr. Montizambert has, after an occupation of twenty-five years, succeeded in establishing; and, also, to the still further improvements this zealous officer has been reporting to the Dominion Government, as absolutely essential for placing the station in the very first rank for the accomplishment of the work assigned to him, viz., the exclusion of infectious disease so far as it lies within human effort by ocean steamers or sailing ships coming from Great Britain, Continent of Europe, West India Islands, South America or Gulf of Mexico.

In the successive applications for the additional requirements, Dr. Montizambert has placed before the Honourable Mr. Carling, the Minister of Agriculture and of Health, the opinions entertained and expressed at the various International Congresses held at Geneva, September, 1884, at the Hague in 1886, and at Rome (Italy) in January, 1897, by the delegates from the various governments of Europe and North and South America, of the application of dry and moist heat, of sulphurous oxide and bichloride of mercury, as being not only vastly in advance of the efficacy of previously reputed germicides, but also for obviating the naturally great objections to quarantine from the long delay involved, as the term implies, and as a consequence the very heavy loss and interruption to trade from demurrage, all of which would be obviated by the additions sought for, the time occupied in the work diminished to fewer hours than previously days, too often fruitlessly for the object sought after. Two years ago, when cholera was prevailing so extensively in India, Spain and Italy, the danger of the disease being imported to our shores, either directly or through the United States sea ports, was so forcibly impressed on the members of our Board that our Secretary, Dr. Bryce, was requested at the end of June, 1886, to visit the Grosse Isle station, and, finding additional enactments urgently required, he prepared an able and exhaustive report of the great national advantages there to be found for the complete isolation of the infected; also, pointed out the additions to be made for bringing this gateway of our Dominion up to a level with modern conception of what should constitute a perfect system of protection.

Last August I also had an opportunity of noticing the same necessity, and the impressions formed during a three weeks' visit I put on record in a report to this Board at its last quarterly meeting, as well as the anxious desire of the Honourable Mr. Carling, that every requirement should be as speedily as possible supplied.

These requirements at Grosse Isle—for two years successfully in use by Dr. Holt, of New Orleans—were by that gentleman most lucidly explained and illustrated at the convention of the

American Public Health Association held last November, at Memphis, Tennessee, and are the following: Extension of western wharf to a point that would give a depth of water sufficient at low tide for the largest steamship or sailing vessel requiring disinfection (say thirty-six feet), to be moored alongside of wharf immediately adjoining the quarantine wharf, and near its water edge a heavy framework of piles each twelve inches in diameter, the structure having an ample base, pyramidal in shape, and forty-five feet in height above mean level of the river. On the top of this a circular, iron tank capable of holding eight thousand gallons of mercuric solution. In the tank, near lower edge, three galvanized iron faucets, to each of which is screwed a lead of three-quarter inch rubber hose, further ends of which lie on the wharf and lengthened as may be required to reach any part of the largest vessel during disinfection, all three simultaneously used fore, aft and amidship.

2nd. For safety, when the wharf is sufficiently lengthened, the placing of the apparatus for evolving and supplying the germicidal sulphurous acid gas, with its battery of eighteen furnaces in a building at the end of the wharf, contiguous to the after hold of the ship to be fumigated. In rough weather, as I had an opportunity of witnessing last summer when on board the quarantine steamer, there is great danger of the melted sulphur escaping from the pans and setting the vessel on fire. The apparatus for the dry and moist heat also to be placed in a separate building near end of wharf.

3rd. For boarding ships in all weather, day and night, a very staunch and strong steam launch eighty to one hundred feet long and of breadth proportionate—the present steam launch, the Hygeia, being unsafe for the purpose in rough weather, the vessels to be examined lying out opposite Quarantine Station at a distance of at least three miles.

The approximate cost of these needed changes is, I believe, estimated at \$120,000, which at first sight may be viewed as a very large sought-for grant, but we can, in the light of former knowledge of the cost of epidemics, reply that it would be only fractional compared with that which would ensue from the combatting of such a wide and long-continued one as the Province of Quebec was afflicted with three years ago, directly traceable to infection brought into our Dominion from Europe; and that, inasmuch as we have every reason for believing that during the present year there will be a larger emigration from Europe than ever before known, the members of our Board considered the question should be viewed far more from a sanitary than from a financial point, as with truth it may be said that there is no greater economy than the saving of human life and the protection of the inhabitants of our Dominion from the personal, social and financial embarrassments that would necessarily follow from an epidemic of either cholera, smallpox or other infectious disease, which, by the additional means asked for, might by the strict segregation of the infected and by the complete purification of baggage, cargo and ship furniture have been prevented.

As this question of cost might prove an obstacle to Dr. Montizambert's obtaining the aforesaid requirements for his station, it was suggested at our last meeting that Dr. Bryce should communicate with the Provincial Board of Quebec, and request that a deputation from their members should be appointed to meet with one of ours at Ottawa and solicit an interview with Sir John Macdonald. This was agreed to. The Chairman, Dr. Lachapelle, the Hon. Dr. Pacquet and Dr. McDonnell, the delegates from the Province of Quebec, and Dr. Rae, Chairman, Dr. Bryce, secretary, and the subscriber, from the Provincial Board of Ontario. On Tuesday evening we had the pleasure of meeting the Hon. Mr. Carling and two of our city members, Messrs. Denison and Small, and it was then arranged that we should ascertain whether we could some time the following day be received by Sir John. We were fortunate in finding him disengaged shortly after, and of being informed in reply to our request for an interview on the subject for which the deputation from the two Provincial Boards had met in Ottawa, that he thought he would be at liberty the next afternoon at four, but that after the morning Council meeting he could give a positive answer. The next day we received a note from him to the effect that the arrangement for 4 p.m. would stand, and at that hour the Hon. Mr. Carling introduced the members of the deputation, there also being present Drs. Bergin and Fissette, members of the Dominion Parliament, and Dr. Montizambert, Quarantine Officer at Grosse Isle.

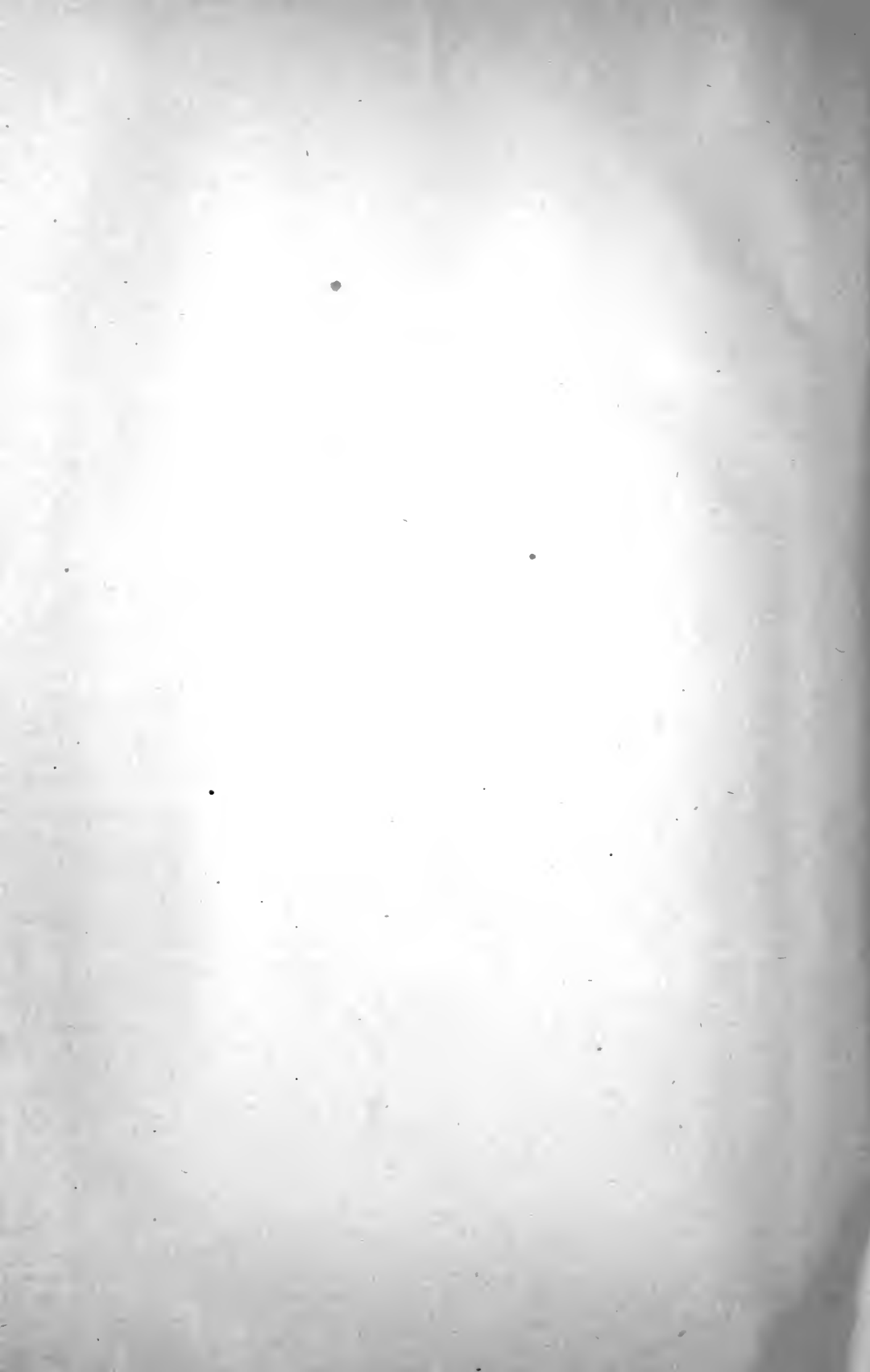
APPENDIX

CONTAINING THE

ANNUAL REPORTS OF LOCAL BOARDS

IN THE VARIOUS

MUNICIPALITIES OF ONTARIO.



ANNUAL REPORTS OF LOCAL BOARDS OF HEALTH.

CITIES.

BELLEVILLE.

Medical Health Officer's Report.

As Medical Health Officer for the City of Belleville, I have the honour to submit my report for the year 1888 :—

At the request of the Board I had orders issued for the cleansing of yards and emptying and disinfecting of water-closets. The number of yards cleaned by personal order of the inspector was 250, hog-pens removed 9, water-closets emptied and disinfected 275, cess-pools closed and disinfected 6, closets removed, being too near dwellings, 7, wells cleaned 17, wells closed by order of Health Officer 4, water-closets changed to dry earth 10, dead animals buried 37. The Inspector made a house-to-house inspection of the city and reported to me its state, and when I considered it necessary I issued the regular notices (in all about ninety-six cases), which the Inspector saw were enforced.

I have during the year granted thirty-nine licenses to parties to sell milk in the city, making each seller sign an agreement to report to me any case of infectious or contagious disease in either their families or places of business, failure to so report resulting in forfeiture of license to sell. I would strongly recommend a license fee for selling milk to be imposed on all milk vendors, commencing on January 1st, 1889, when licenses must be renewed. I have examined the milk of a number of the vendors and found it fairly up to standard quality. In one instance the milk was adulterated with water to a large extent, and I warned the party. I again examined the milk some time after and found it all right.

The mortality from January 1st up to November 1st of the present year was 142.

I have had twenty-one cases of fever reported to me, the medical profession being divided as to its character, some contending it was malarial, while others said it was typhoid. The total number of deaths recorded from the disease was four. I have had one case of diphtheria and one case of scarlet fever reported to me, both of a mild character. We have reason to be thankful for the position our city holds in the total absence of those dread scourges, namely, diphtheria and scarlet fever, this being the third year that there has not been a death from either of those diseases recorded in either of the cemeteries.

I would again draw the attention of the City Council to the absolute necessity of drainage, and more especially that so many of the citizens are taking water from the water works. The greater part of the preventable diseases are caused in my opinion by want of a proper system of drainage, and bad water from the wells among the thickly populated places. The wells in dry seasons such as this and last year, were extremely low. The slops and other refuse from the houses, owing to absence of sewers, are thrown into the yards, and in some instances the water-closets are only a few feet from the wells. A shower of rain comes on and all the decayed animal and vegetable matter and filth with which the ground is saturated, find their way into the wells for the production of fever and other diseases.

A great want is in not having a proper system of scavenging for the city. I think the Council should license one or more scavengers to do the work.

Complaints appeared in the public press about the state of the river this summer ; but what can the Board do in the matter, when both the county and city buildings drain into the river in direct violation of not only the Public Health Act, but the city's by-laws ?

When attempting to prosecute private individuals, we were met with the sneer that we should make the city carry out its own by-laws before prosecuting private individuals for doing what the city had done for years.

I have again drawn the attention of the Provincial Board of Health to the sewage of the Deaf and Dumb Institute, but nothing has been done so far. It is now over a year since the matter was brought before the Provincial Board, and in a case of such vital importance to the well-being and health of the inhabitants of this city, it should have been in my opinion attended to before this. I may say that I stated in a communication to the Board, that should our water system become contaminated with sewage from that source, the city would hold the Board responsible. I think it would be well for the Council to take some action in the matter at once.

R. TRACY, M.D.,
Medical Health Officer.

BRANTFORD.

Medical Health Officer's Report.

I have the honour to present the following Report for the City of Brantford for the year ending October 31st, 1888 :—

The number of deaths within the city limits during the year was 220, being at the rate of $16\frac{1}{4}$ per thousand in an estimated population of 13 500. The death-rate in 1887 was the same. The Brantford death-rate appears to be a little below the average rate of Ontario cities and towns.

Of the 220 deaths in this city, 96 were of children under five years of age, and 31 of persons over seventy years.

The deaths from the principal zymotic diseases are as follows :—From typhoid fever thirteen as compared with eight deaths last year; diphtheria 8 as compared with 19 last year; croup 2 as compared with 3 last year; scarlet fever 2 as compared with 9 last year; measles 1 as compared with none last year; whooping cough 5 as compared with 1 last year, and from cholera infantum and diarrhoeal affections 26 for 23 last year.

The eight deaths from diphtheria represent one in every 1,680 of the population. The average in the thirteen Ontario cities was one in every 920.

Scarlet fever has prevailed to some extent; fifty-nine cases were reported to the Board of Health, and two deaths occurred.

Every possible precaution has been taken to prevent the extension of scarlet fever, diphtheria, etc., in the schools, by rigidly excluding all children coming from houses where the diseases were known to exist.

The Board has supplied the schools with blank forms for notification of disease, and during the last six months fifty-seven notices have been received from the East Ward School, twenty-five from the North Ward School, sixteen from the Central School, four from the King's Ward School, and one from the Separate School. It is, therefore, obvious that while this important duty has been faithfully performed in some of the schools, in others it has been much neglected.

During the half year 137 notices were sent to the free library, requesting that books be not delivered to persons from infected houses, and that any books returned from such houses be withdrawn from circulation until they shall have been examined by the Medical Health Officer. Under this regulation fifty-six volumes were withdrawn from circulation. Of these, twenty-seven volumes were restored to circulation, it being clear from the known facts that they were not infected, and twenty-nine volumes were removed to the Health Office. Those of small value and which have been handled by patients with diphtheria and scarlet fever, it is proposed to destroy, others may be returned to the library after disinfection. Fifty-six cases of typhoid fever were admitted into the John H. Stratford Hospital, of whom seven died; a large number of the cases admitted were of great severity, several dying within a few days after admission. Six

deaths occurred outside of the hospital, and it is safe to assume that not less than seventy cases of the disease were treated external to the hospital, showing not less than 126 cases of genuine typhoid fever. This is a large number, and the number of deaths, about one in 1,000, shows a large death-rate from that disease. The causes of this undue mortality from typhoid are not far to seek. Bad water, and the total absence of any kind of sewerage are the obvious causes.

A very large number of wells are badly contaminated ; and repeated examinations have shown that the city water obtained from Wilkes' creek, which serves the purpose of an open drain, is of a better quality than that of a large proportion of the city wells. As the construction of the new water works is now in progress, it may be fairly expected that when these are in operation, and the use of water from bad and doubtful wells is discontinued, the causes of typhoid fever (as well as of much other sickness), will be in a large degree effectually removed.

The other principal cause is the absence of sewerage. The saturation of the soil during twenty-five to fifty years in the older parts of the city, by liquid refuse, has poisoned the ground, and not only defiled the wells but contaminated the air in and about our dwellings. It is much to be feared that typhoid fever, diphtheria, and other zymotic affections, notwithstanding the acquisition of a good water-supply, will not diminish but will rather increase, unless the sewerage question is promptly dealt with.

Besides its general importance there is a special need for sewerage in relation to manufacturing establishments, on which the business of the city so largely depends.

Brantford is exceedingly well situated for establishing sewerage, on the separate system, at a comparatively small cost ; and this work is of such importance in relation to the value of real property in the city, which value must certainly be increased at once far beyond the cost of the works, that aside from the question of health it should receive the warm support of every property holder in the city.

The work done in sanitary inspection during the year has been very large and has been exceedingly well done. The Inspector's books show that 1,207 house-to-house inspections have been made, exclusive of inspections of dairies, slaughter-houses, soap works, etc. So far as the reports show, this is two or three times as great a number, in proportion to population, as have been made in any other city in Ontario. Three hundred and twenty-nine complaints were entered in the complaint book, all of which were dealt with as well as was practicable. Four hundred and fifty privy-pits were emptied during the year. Seventeen prosecutions for various breaches of the Health Act were entered, and convictions were secured in every case, fines being imposed to the amount of \$77.85.

At the February meeting of this Board a resolution was passed directing the total abolition of all remaining privy-pits in the Queen's Ward and the substitution of dry-earth closets, the work to be carried on as rapidly as possible. Three years ago the number of these pits in this ward was nearly 400 ; at the time of the above order there were about 260, and the Inspector reports that only ninety-seven now remain. In every case the pits were cleaned and filled up with fresh earth. As more than 100 new dwellings have been erected, in all of which the dry-earth closets have been adopted, it is estimated that 325 new dry-earth closets have been established during the year. That so much has been accomplished in face of considerable difficulties must be regarded as very satisfactory.

The dry-earth system, which has now come into use to such a considerable extent in this city, has, wherever it has been properly regulated, given good satisfaction. To a certain number, however, it has been by no means satisfactory, although there are very few, if any even of these, who would advocate a return to the old system. The public cannot be expected to be satisfied with this system, or with any system, unless it is well managed.

In those parts of the city where the grounds around dwellings are limited and where sewerage is necessary, on account of the impossibility of otherwise disposing of liquid refuse, water carriage may hereafter be substituted for the dry-earth system, by those who may desire it ; but for those localities where it is applicable, the dry-earth system will still prevail, as when properly managed it is no more disagreeable or troublesome than the water carriage system, and is superior to it in safety and economy.

The chairman referred at the February meeting of this Board to the garbage question, and urged the necessity of the systematic removal of garbage being undertaken as a public work.

In some places this work has been undertaken by the Boards of Health, but the increased expense of a separate service for the work is very considerable, and it can be managed with great efficiency and at much less expense in connection with street cleaning and other city work. The many important and difficult matters the City Council have had in hand this year have caused consideration of this matter to be deferred, but it is one of such necessity that some measure dealing with it should be introduced without further delay.

The milk supply of this city is furnished by twenty-five dairies, nearly all situated in the township. The number of cows reported on July 1st, was 357, and the daily supply 2,277 quarts.

All the dairies were inspected in March by the Sanitary Inspector, in company with Veterinary Surgeon Stewart, with fairly satisfactory results; several of them have been inspected a number of times during the summer and autumn.

Samples from all the dairies have been tested twice, and from several of them three or four times. The results of the earlier tests were to show the milk in the majority of cases poor, comparing unfavourably with samples of whole milk taken personally by the Medical Health Officer and Sanitary Inspector from several creamery herds and private herds in the township. Later tests showed considerable improvement.

It is intended, with the approval of this Board, that the work of inspecting dairies, testing samples, and publishing results shall be continued as frequently as possible, having regard to the labour involved and the limited time at the disposal of your executive officers. Milk forms but a relatively small part of the diet of most persons in ordinary health. For the sick, on the contrary, it is often the main dependence, and especially for fever patients. For the former class the quality of milk is very important, but for the latter class, often living exclusively on a milk diet for many weeks, it is a matter of life and death. For these unfortunate sick it is, therefore, specially imperative that the milk should be as nearly perfect as possible. It should be derived from perfectly healthy cows of good breeds; the cows should be kept scrupulously clean in perfectly clean stables; they should be fed on the most suitable foods of the best quality, and be supplied with pure water.

So far as the John H. Stratford Hospital is concerned, it is gratifying to know that the governors fully realize all this, and that they propose, with that commendable solicitude for the welfare of the patients which they have always shown, shortly to provide that institution with a dairy of its own, being satisfied that that is the only certain way of securing for it a supply of perfect milk.

In concluding this partial report of some of the principal matters which have engaged the attention of the Board of Health during the past year, I wish to mention the especially active interest the Chief of Police, as one of its members, has taken in its work. Owing to his position this has been of great service, enabling us to do many things easily and cheaply which would have otherwise been difficult and expensive to accomplish.

EGERTON GRIFFIN, M.D.,
Medical Health Officer.

GUELPH.

Medical Health Officer's Report.

I have the honour of submitting the following report upon the sanitary condition of the City of Guelph, for the year ending 31st October, 1888, in accordance with the Public Health Act, 1884 :—

No epidemic visited the city during the year. The total number of deaths during the year has been 189. Taking the population of the city at 10,173, according to last

year's assessment returns, it places the death-rate at 18.5 per 1,000; and taking into consideration the large number of people from the rural districts who came to the city to avail themselves of its hospital, this, I consider, is an exceedingly low death-rate, and speaks well for the sanitary condition of the city. Of the infectious diseases, 175 cases of diphtheria were reported at the Health Office, 17 cases of which proved fatal. Of scarlet fever only two cases were reported, and no deaths. The inspection of milk and cow-byres during the year, in accordance with the by-law, has been carried out, and has resulted, from what I can learn, in a marked improvement in the quality of the milk. During the year thirty-one permits to obtain licenses to sell milk have already been given, subject to cancellation for infraction of the by-law.

I regret very much that the by-law for extending the water mains in the city during the past year was defeated, as the wells are so liable to contamination from surface drainage, pollution through the soil from water-closets and other sources, that I am afraid a very large number of the wells in this city are totally unfit for use. During the past summer a great many complaints have been made with regard to the bad smell of the river, between the Eramosa and Allan's Bridges, owing to the water being used by the Electric Light Company causing the banks of the river to be exposed all day to the heat of the sun. The matter was brought to the notice of the Board of Health, and some members expressed their opinion that a great deal of the bad smell from that part of the river was due in a great measure to the filth running from the Alma Block and other places along the river, and the Sanitary Inspector was instructed by the Board to notify all parties running nuisances into the river to stop it at once, and in the event of his instructions not being carried out, to instruct the city solicitor to take action; and the Sanitary Inspector informs me that all the persons whom he notified acted promptly. I also gave instructions to have the river cleaned from rubbish, which had accumulated near Allan's bridge, and no less than twenty-five dead animals were found amongst it. Since the cesspools have been shut off and the river cleaned, no complaints have been made.

I would again call your attention to that part of my last report where I strongly recommended that a system of removing the garbage from the city should be adopted. A scavenger under the instructions of the Sanitary Inspector should be employed and the garbage removed at least twice a week in summer, and once a week in winter, and the whole cremated. During the year the Sanitary Inspector confiscated four loads of beef, three loads of pigs and four baskets of fowls, as being in his opinion unfit for human food.

I have written to the chairman of the Board of Education, requesting him to make it compulsory that all children attending the public schools should show a certificate that they had been vaccinated, and I trust that this will be carried out. All the medical gentlemen in the city have been supplied with blank forms for that purpose.

The Sanitary Inspector reports the following work done during the year, which I consider large :—

Number of yards examined	272
Number of water closets emptied	186
Number of yards found in good condition	184
Number of hog-pens removed	15
Notices served for dirty yards	43
Number of old wells cleaned	3
Analysis of well water	6
Dead animals buried	115
Complaints made at Inspector's office	142
Number of houses placarded for contagious diseases	177

The Sanitary Inspector has performed his duties to my entire satisfaction.

THOMAS A. KEATING, M.D.,
Medical Health Officer.

HAMILTON.

Medical Health Officer's Report.

I have the honour to submit my annual medical report of the sanitary condition of the city for this year, ending on the 31st October.

There were 553 cases of contagious diseases reported by physicians to the Health Department and 64 deaths, a list of which may prove interesting.

	1888.	
	Cases.	Deaths.
Diphtheria	163	49
Scarlatina	173	3
Typhoid Fever	127	12
Measles	68	..
Whooping Cough	22	...

There are 42 cases less of diphtheria than in 1887; the deaths are, however, 18 in excess. Typhoid fever would appear to be on the increase, but many of the cases reported did not present the usual characteristics of enteric fever. Several premises where this disease was reported from were examined, the conditions found were similar to those mentioned in last year's report. Scarlatina cases number four less than in 1887; a few cases had not been reported. Complaints having been made the delinquents were summoned for neglect to do so, but owing to the conscientious scruples of some of the witnesses in giving evidence, there was no conviction. There was only one case of obstructing the Inspector in performing his duty. The parties implicated were fined by the Police Magistrate.

The rule agreed to by the medical profession not to give certificates of fitness to attend school in cases of contagious disease until one month had elapsed since the last case occurred in the house, is so badly observed that the effect is to propagate disease.

The mortality for the year numbers 729. Taking the population at 44,000, the death-rate is 16.5. The highest mortality occurred in the months of May, July and August, numbering in order, 71, 87 and 74. This statement is confined to deaths occurring within the city limits. A good many burials take place in our cemetery from the Township of Barton, which, of course, are excluded, as we cannot avail ourselves of its population in taking the death-rate. It is almost needless for me to say that the three health officers under my own immediate observation have been diligent and effective in the performance of their several duties. The fewer complaints made this year about the removal of garbage would indicate a better working of the scavenger system.

With reference to the inspection of plumbing, this work received particular attention at the time of the house-to-house inspection made by Inspector Peacock, as the books of inspection will verify. In many instances plumbing and sewer connections were found to be very imperfect; untrapped sinks and leakages were numerous; water closets were in some instances badly located, and the pattern of such kind as permit the escape of sewer-gas. Ventilation was also badly provided for, and the water supply for flushing often so scanty as to be next to useless. All those errors were remedied as far and as quickly as possible. Those defects were apparently due to cheap work, and probably also to inexperienced labour. Cheap work in plumbing and sewer connections is to be deprecated, but extortionate charges should be guarded against. The bad sewer connections which have recently come to light, must have been put in previous to the inspection referred to, and such bad work will turn up from time to time. There is little doubt but that any ordinary inspector will be able to detect flaws enough to be remedied during the next quarter of a century. What seems to me to be particularly necessary is, that in all buildings to be erected the plans of sewer connections and plumbing should receive the written sanction of the Inspector. I would respectfully suggest to your Board—it being your province to see that proper provision is made for carrying out the clauses of the

Health By-law in relation to buildings—that although the appointment does not rest with your Board, it would conduce more to the interests of the city to appoint an assistant inspector of buildings, whose duties would combine the experience of a plumber, a knowledge of the proper connection of sewers with buildings, and of all such matters as pertain to sanitary and other regulations in connection with the inspection of buildings. That such an office should be a department in itself, and distinct from the Health Inspector's office. I have occasionally noticed the want of such a department where records could be kept to meet the requirements of the Health By-law, and I am fully convinced that such an office presided over by your Building Inspector, and an assistant qualified for the position, would prove a convenience and more of a public benefit than the establishment of the office of plumbing inspector alone.

I would also bring before your notice the very inefficient clause of the by-law relating to earth closets and their management, and suggest to your Board the expediency of amending it. The system is both theoretically and practically sound, provided that regulations are made to enable it being properly dealt with.

I beg also to report that according to instructions from your Board, I visited the cities of New York and Boston last June and made enquiries into the system of inspection and methods of testing the quality of milk in both cities. All the information that could be desired was cheerfully given, and I was not even asked for my credentials, which I carried in my pocket.

It would take too much space to enter minutely into every particular connected with it, and I will be as brief as possible. In New York the inspection of milk is extensively carried out. There are eight medical inspectors doing daily duty; each of them is required to examine 200 samples and report weekly. One of them is detailed alternately for morning duty to inspect milk direct from the waggons; the beat for each inspector is arranged at the head office. The Inspector is met at the appointed place by a policeman, whose duty is to stop the waggons as they appear. None of them attempt to evade him. The Inspector takes the sample from the vessel himself and examines the specific gravity with the New York Board of Health Lactometer; he then takes the temperature and corrects the specific gravity at 60° Fahrenheit. All milk which does not register 95° on this Lactometer, and which does not also bear inspection derived from its colour, taste and odor, is confiscated and consigned to the nearest sewer. I saw forty quarts so disposed of one morning. It seemed to me very summary punishment, but the case did not end there, as the driver having the milk in his possession at the time was held responsible, as well as the party to whom the milk was consigned. Both were summoned before the District Court. I did not hear what the result was, but was informed that the fine would not be less than \$50.

In Boston there are three inspectors of milk (not medical men). It is their duty to collect samples and bring them to the office of the city analyst. All samples are there examined with the Fesor Lactoscope, and when found necessary are subjected to a minute analysis. The Lactometer used here gives the specific gravity direct, which is corrected by the temperature at 60° Fahrenheit. Both cities have no jurisdiction outside of their respective limits, so that the person having the milk in possession with intent to sell, is held as the responsible party. I received a lot of literature from both offices on the subject of milk, and also from the State Board of Massachusetts.

I expected to have got further information on the milk question at Portland, that city being in the land of prohibition. On enquiry, however, I was informed that the milk supply was generally good, and seldom required official examination—that there was no extra demand for the supply.

I received also a good deal of information from Mr. McFarlane, Chief Analyst of the Inland Revenue Department at Ottawa, and have followed out the directions of circular No. 2, issued by the Department.

The system of inspection carried out in Boston is more suitable for our Health office than that of New York. The latter, though very efficient, is very expensive, but the people get good value for it.

The three grades of milk arranged by the Dominion Government, I presume, are intended to show to what extent whole milk may vary in quality, and that all percent-

ages of fat above the highest and lowest grades were due to adulteration. Milk showing a percentage of fat over 4.75, would have an undue amount of cream, a form of adulteration that few consumers would object to. If the dealer can sell milk at the lowest Government average, namely, 3.50 per cent. of fat, we want no other standard for our office. If the dealer gives a better grade he will get credit for it.

The percentage of butter fat can be very accurately arrived at by means of the Fesor Lactoscope. Professor Babcock, of Boston, has shown from a series of comparative examinations, that in ordinary samples of fresh milk, (such as we get at the Health Office), it gives the percentage within one-quarter of one per cent. of the correct figure, as shown by chemical analysis. I have invariably allowed more than that in addition to the reading of the lactoscope, so that in nearly all cases the dealer must have been getting more than full value for the quality of the milk than he would get from a chemical analysis. The total amount of solids in milk can also be ascertained by calculation, according to the specific gravity taken at 60° Fahrenheit, and the amount of fat as shown by the lactoscope.

From my own experience, having tested a large number of samples, I am perfectly satisfied that the percentage of fat should not be lower than 3.50; even that admits of higher grades being reduced to that standard, and any dealer who wants a lower standard, in fact wants no standard. Not long since I examined four samples of milk taken from four different cows, which were brought to me *direct* from them by the dealer; none of the samples gave over 3 per cent. of fat. That very day your inspectors brought me four separate samples direct from the same cows, and each of them gave a good 3.75 per cent. This fact will give you an insight as to how the milk trade can be conducted.

It has been remarked that the public health Acts were enacted solely with reference to health. This is in the main correct, but it was never intended to be so construed, nor does the Act read so, that trade should be allowed to conflict with health and have full sway to the injury of the latter. The relation between health and trade is so intimate as regards the milk supply, that you cannot separate them with consistency, and you cannot tell now how many untimely deaths have been caused by the want of a good by-law regulating the sale of wholesome milk. Such a by-law has met with the approbation of your Board, and its ratification by municipal authority is earnestly desired. No honest milk dealer could object to it, and the sooner the dishonest man knows that he has to discontinue the trade, the better for the general public. Poor and rich are equally interested.

I. RYALL, M.D.,
Medical Health Officer.

KINGSTON.

Medical Health Officer's Report.

I have the honour to submit the following report upon the sanitary condition of the city for the year 1888:—

It gives me much pleasure to state that the sanitary condition of our city has been for the past year very favourable. We have, however, to some extent suffered from diphtheria and typhoid fever; the death-rate has been comparatively small from the latter disease. These affections are attributable principally to defective drainage of houses and the use of bad well water, which I trust may be overcome now that we are obtaining a perfect system of water works, with cheap water rates; and, I trust, added thereto we shall have a filter of the best maker.

Milk.—I regret to report that our Local Board has not as yet taken any definite action in reference to our milk supply. This is one of the necessary sanitary matters which requires to be looked into, milk being the chief nutriment for invalids and infants. Other cities have taken necessary action in dealing very definitely therewith, considering it of paramount importance.

Slaughter Houses.—The Sanitary Inspector and myself inspected all the slaughter houses both in and out of the city, according to the requirements of the Statute, and found them most generally favourable.

Sewers.—Now that the council is making such rapid progress in the completion of the main drains to the outermost parts of our city, would it not be well to take into consideration the building of one grand trunk sewer, and thus convey all the filth that may be emptied therein to one common port or receptacle, to be then carted away unto the land to enrich the soil and prevent the contamination of our water front?

Dry Earth Closets.—During the past year the number of these receptacles has greatly increased, and with a little closer attention on the part of the city scavenger (who is not sufficiently remunerated), thereby removing the cause of complaint, we might be enabled to convince many, whose premises are so situated as not to admit of a privy vault, to enlist them in the scheme, which is far ahead of the vault system when properly constructed and attended to. In attending to the details of the many complaints laid before the sanitary inspector and myself, we must return thanks to the chief and police force for the very efficient and satisfactory manner in which they have, upon all occasions, assisted in the proper carrying out of the law.

Sanitary Inspector's Report.—During the year the sanitary inspector issued 531 permits to open and clean out privy pits, from which 5,045 barrels (of 40 gals. each) of night soil were removed and deposited upon the nuisance ground; 163 dead animals were removed from public streets, etc.; 468 notices have been served on parties to abate nuisances, of which 291 were for filthy privy-pits and 177 for dirty yards and cellars.

The following table will show the number of cases of contagious diseases reported, and the total number of deaths for the year :—

	Diphtheria.	Scarlet Fever.	Typhoid Fever.	Typhoid Malarial.	Measles.
Number of cases	35	6	34	9	12
Number of deaths..	9	.....	5	.....	.....

In closing this report, I hope that the Local Board of Health will meet more regularly in future, and thus give its moral support to its officers in the carrying out of all sanitary measures.

S. H. FEE, M.D.,
Medical Health Officer.

LONDON.

Medical Health Officer's Report.

I have the honour to present the following sanitary report of the city of London for the year ending November 15th, 1888 :—

The health of the city during the year has been exceptionally good. There were 438 deaths, as compared with 455 last year. Estimating the population at 27,000, places the death-rate at a fraction over 16 in the 1,000, as compared with 17.16 last year. Comparing this with the death-rate of the twenty-six cities making mortuary returns to the Dominion Government, it is found that these cities and towns had an average death-rate

for the year of 23 in the 1,000. The average death-rate in seven Quebec cities was 31 in the 1,000, and the average in 13 cities in Ontario was 17. Of the 438 deaths in the city this year, 181, or over two-fifths, were under five years of age. Thirty-six reached the allotted three score and ten. Eleven attained the age of eighty, six of eighty-five, one of ninety-two, two of ninety-three and one of ninety-four. The largest number of deaths occurred in December and January, which had 51 and 44 respectively. June, which is invariably the healthiest month, had only 24. The deaths from zymotic and preventable diseases were as follows: Of diphtheria, there were reported 53 cases, six being sent to the city hospital, and 15 deaths. Of typhoid fever, there were 18 cases reported, 19 sent to the hospital, making 35, and 8 deaths. Thirteen cases of scarlet fever were reported, and 1 death. Consumption carried off the large number of 44, and cancer is credited with 15.

Some provision should be made for extending the trunk sewers so far into the river that their mouths will always be under water. A few lengths of 18 or 24-inch iron sewer pipes continued from the end of the sewer would answer the purpose well.

Although smallpox prevailed during the summer in Buffalo, Detroit and Sarnia, and to some extent in Toronto, it fortunately did not reach London. Orders were issued by the Assistant-Superintendent, Mr. Larmour, to the railway officials at the Bridge, Fort Erie, Windsor and Sarnia, to keep a careful watch and prevent, as far as possible, suspected persons entering from the east or west by trains.

The river should always be kept at the same depth. When this is not done, every time the water is lowered the alluvium deposited along its banks is exposed to the heat and air, creating malaria. Keeping the river always at the same depth should not interfere with the efficient working of the water-works machinery, for, as the water at the drain is lowered, the force exerted against the two turbine wheels is proportionally less, and more water is required to work the engines up to the same power—a useless waste of water.

The river is thus lowered five or six inches. When the banks are steep this matters little, but when the water is shallow, which is the case from Kensington Bridge to the Cove, this fall of a few inches means the periodical exposure of hundreds of square yards of residuary deposit to the action of the air and sun.

The need of a sanitary inspector of house plumbing is becoming more and more a necessity in the interests of the public health. Much of the house plumbing done in the city is of the worst description. This is not so much the fault of the plumber as of those who build houses to let, and then have the plumbing done as cheaply as possible, without any regard for the safety of those who will occupy them. Some of the house plumbing done in the city is so bad that a more effectual means of giving the inmates typhoid fever could not be devised. Toronto and some other cities of the Dominion have taken steps to remedy this evil, by appointing experienced sanitary plumbers as inspectors, whose duties will be to exercise a wholesome supervision over cheap slipshod plumbing.

Milk Supply.—Ninety dairies have been inspected, and 147 analyses of milk made since 1st of January. Fifteen of these samples were taken from fifteen herds in my presence, the cows being milked out, the whole milk well mixed, and a sample taken. The quality of milk being estimated by the percentage of butter fat it contains, the other solids, such as albuminoids, milk, sugar and ash, are not given in this report. Of these fifteen samples of whole milks, the percentage of butter fat ranged from 2.15 to 2.12, only one sample, however, being below 3.17; and the average percentage of butter fat in the whole fifteen samples was 3.73. Of 162 samples of whole milks taken from herds from Halifax to Toronto last year by Mr T. McFarlane, Chief Analyst of the Inland Revenue Department, and analyzed by him, the total average of butter fat in the whole 162 samples was 3.86 per cent., and he, therefore, recommends that, in case the Government establish a standard for the Dominion, it be not less than 3.50 per cent. Although the quality of the milk sold in this city has greatly improved in the last six months, and no doubt will continue to improve, still, this standard, for the present at least, appears to be too high; and in the event of this Board establishing a standard for the city, I would recommend that it be not less than 3.25 per cent. of butter

fat. The by-law requiring the inspector to have all milk wagons duly numbered and the owner's name has not been complied with, except in a few instances, and gives rise to trouble and confusion.

T. V. HUTCHINSON, M.D.,
Medical Health Officer.

OTTAWA.

Medical Health Officer's Report.

In laying before you this my annual report for the year ending on October 31st, 1888, I am pleased to record the fact that notwithstanding the inauspicious outlook at the beginning of the period comprised in this report, the mortality for the past twelve months is very little in excess of that of the previous year. One of the reasons of this excess has been an epidemic of typhoid fever, such as Ottawa has never before experienced. This disease, a few cases of which developed earlier in the summer months than usual, suddenly invaded the whole community in the second week in November last; though mild in type in the large majority of cases, the extensive prevalence of the disease naturally caused much anxiety, and a great deal of speculation as to the evil influences which had been productive of such deplorable results. Fully conscious of the gravity of the situation, your board deemed it desirable to demand the assistance of the Provincial Health authorities to investigate and help us, not only to get over our present difficulties, but also advise as to the measures to be adopted to prevent a repetition of the same.

The investigation through events unavoidable was delayed, although this request made in the first week of December last, and as a consequence the investigation did not then prove as satisfactory as if made earlier in the season. However, all was done under existing circumstances that could be done to throw light on a question surrounded with so many difficulties as the causation of this epidemic; and the conclusions reached as a result of the labour of this commission, as reported to your Board, are evidently in support of the following views:—

That whatever part may be attributed to general influences beyond the control of health authorities, it being a recognized fact that protracted droughts, and the evil effects of the unusual condition of things created thereby, pre-dispose to, and are often followed by, typhoid fever, there were reasonable grounds to suspect that our water was an active agent in the distribution of this disease in the epidemic of last fall. In support of this view may be given the following reasons:—

1st. The admitted fact, by all those whose opinions on such matters are worth having, that in the history of all such epidemics, in eighty-five cases out of a hundred, water is the medium through which the disease is spread, hence the saying—pure water, no typhoid.

2nd. The suddenness of the onset of the disease in last fall's epidemic. Typhoid, which could scarcely have been said to have been more prevalent than usual at that season of the year up to the second week in November, suddenly, within the space of ten days, overspreading the whole city.

3rd. The extent to which the disease prevailed, there having been about 1,500 cases in the city and surrounding suburbs. There are other reasons which will be cited hereafter in this report, when on the subject of our water supply. It is pointed out, also, on the other hand, that want of drainage, or improperly made private drains, or defective plumbing and modern conveniences within the dwelling houses, are all pre-disposing to, and, to a certain extent, factors in, the development of such diseases. That in a number of instances during the epidemic of last fall, such evil influences were at work is readily admitted as not incompatible with our present state of knowledge, nor yet misrepresenting the condition of many houses in our city.

To what extent typhoid fever contributed to increase the death-roll of 1888, will appear in the mortuary returns for this year, and from a comparative table of deaths from the same cause for the four previous years. Another cause of this increased mortality has been the prevalence of diphtheria throughout the year. This disease, in the large majority of cases, originates from the evil effects of bad drainage and plumbing, though its chief work of propagation is by personal infection, against which, proper isolation is the only reliable means of safety. Apart from these, few other diseases looked upon as preventable, prevailed to any extent during the year, with the exception, perhaps, of cholera infantum, and other diarrhoeal affections among infants, chiefly during the month of July last. These, though to a certain extent due to what is commonly called malaria and other atmospheric influences, in my opinion, are largely the result of gross ignorance or reckless negligence on the part of parents to care for their offspring during the first two or three years of their existence.

Hospitals and Isolation of Contagious Diseases.—The hospitals for the isolation and care of contagious diseases have been maintained throughout the year on an efficient footing; and the requirements of the law as regards the notification of the existence of any such cases, their isolation and other precautionary measures essential to the public welfare, are now better understood, and after much vexatious battling against prejudice and stubborn opposition, are more readily complied with. The legal prosecutions instituted to enforce the law in such cases, should convince the public of the sincerity of our purpose, whilst the results obtained should inspire confidence in the measures advocated. For I may safely say, that it is due to the constant vigilance and prompt action of this department as regards such cases, that this city, during the last six months, was not overrun by an epidemic of diphtheria twenty-fold more terrible in its fatality than the epidemic of last fall.

Our Water Supply.—The purity of our water which, up to last fall, had never been questioned, then became doubtful, for the reasons above given in connection with the causation of the disease then prevailing. Another reason throwing some doubt on the purity of our water, and tending also to connect it with the cause of last fall's epidemic, were the characteristics of the fever as relates to its fatality; the death-rate having scarcely reached three per cent. of the total number of cases.

This, it is contended, points to a contamination of our water with vegetable rather than with animal organic matter; a fact which seems also pretty clearly demonstrated by the different analyses to which it was subjected.

It is evident, at all events, that so far as it relates to the causation of specific diseases, the quality of the pollution is the essential knowledge sought, and not the quantity; that the chemical analysis of water will not determine the presence or absence therein of specific germs, whilst the different conclusions reached by analytical experts in the analysis of the same water, are calculated to throw much doubt on the reliability of such processes or methods to determine the wholesomeness or unwholesomeness of water. Then another circumstance, which, even to the casual observer, is not calculated to impress one with the belief that our water is above suspicion, are the surroundings of the inlet of our water supply. However, this important question is still being investigated, and no doubt that when convinced of their necessity, and satisfied as to the best means to be adopted, nothing will be left undone to effect the needful ameliorations to secure purity in this necessary of life.

Our Schools.—It is a matter for public congratulation to note the progress made in some of the schools of this city during last year as to their mode of heating, ventilation and closet accommodation. Not only is this noticeable in the newly erected school houses, but in others also, where, regardless of expense, the requirements of hygiene have been complied with in this respect. Others which have not yet reached such a standard of hygienic perfection, it is to be hoped will soon emulate this praiseworthy example, and do away with the defective systems made to do service up to the present.

Scavenging.—The removal from the household of waste matter, such as kitchen refuse, and ordinary garbage as often as needed, more especially during the summer season, has been very frequently a cause of annoyance, and not unfrequently a source of

danger to the well-being of the community, whilst the proper disposal of the same has been to the health authorities a source of anxiety and trouble.

This matter, which all recognize as very important in a sanitary point of view, and which has been time and again in one way or another brought to the knowledge of your Board, last year engaged the attention of the municipal authorities more than usual, and the erection of a cremating furnace had been contemplated.

This mode of disposal of such matter is no doubt effectual, whatever may be said of its economic value, but, in my estimation, it is not for our present needs an indispensable necessity. With a properly organized system of scavenging under the control of the Board of Health, there is no reason why such matter could not be disposed of in a much more economical way for some years to come without endangering public safety.

Such a system has been adopted with very satisfactory results, for instance, in Hamilton, a city which, so far as extent of territory and population, has about the proportions of Ottawa, and I have no doubt that some such system could be carried out here with advantage. At all events, the public requirements in this respect are such as to make it imperative that some such scheme be devised, and no doubt this question will early engage the attention of the municipal authorities of next year.

Removal of Night Soil.—I can safely say, as regards the work of emptying privy vaults, details of which are fully given in the Sanitary Inspector's report, the public requirements in this respect during last year, were more satisfactorily attended to than ever before during my term of office. This work is done by contract, by the pail and barrel system, is supervised by two assistant inspectors, and the matter removed is deposited on farms as a fertilizer. This mode of disposal, when properly effected, in my estimation, offers no special objections in a sanitary point of view, whilst it is a material benefit to the parties so utilizing it.

Abatement of Nuisances.—The number of premises visited during the year with a view of causing the removal of unsanitary conditions complained of or otherwise detected, whether due to want of or imperfect drainage, defective plumbing, or otherwise caused; and the number of prosecutions instituted to enforce the regulations of this department in such matters, as detailed in the Sanitary Inspector's report, are evidence that during the past year the work of this department has been pushed with all the facilities at our command. In fact, so far as individual improvements are concerned, the past season has been one of marked progress in sanitation. It is to be regretted, however, that owing to the dilatoriness of the municipal authorities to carry out the recommendations of your Board, as regards the construction of subsidiary drains on a certain number of streets in this city, this department has been powerless to improve the unhealthy condition of many dwellings and premises thereon. Next year's council will no doubt give the matter a favourable consideration, and the work of construction pushed on early next season, with all the rapidity due the importance of such sanitary improvements.

The construction of a sewer in Canal Street to connect Lewis Street drain with the main sewer, which is now being made, is worthy of special mention as a work calculated to afford facilities for the proper drainage of a large section of the city. Whilst on this question of drain-making, I cannot too strongly urge the indispensable necessity of the careful supervision of such works, the vital importance of which, to the well-being of the community, is second only to plumbing. The benefits to be derived from the appointment of a person of undoubted competency to superintend the proper making of such works, whether private or public, in all its details, can only be calculated by the amount of evil they are productive of when improperly done.

Vaccination.—The law requiring parents or guardians to have children vaccinated has been of little effect during the last year; few vaccinations were made. In fact, nothing less than an epidemic of small-pox will cause the public to wake up to the necessity of availing themselves of this preventive measure. It is fortunately true that we have had no small-pox here for some time past, but its presence in several localities of this Province should be a sufficient incentive to be prepared before it is too late, for we cannot foretell how soon it may be among us.

Inspection of Dairies.—The law, so far as it relates to the inspection of dairies and the licensing of milk vendors, has been carried out last year to the extent of our possibilities ; I am forced to say, however, that owing to circumstances beyond our control, this matter has not received all the attention it was our intention to give it. The fact is, the public requirements as regards this and other duties devolving on the Sanitary Inspector and myself, are such as to make it an indispensable necessity that a horse and carriage should be at the disposal of this department. This is now the more imperative in view of the large suburbs presently to be included within the limits of our city.

A. ROBILLARD, M.D,
Medical Health Officer.

ST. CATHARINES.

Chairman's Report.

I have the honour of submitting to you our Annual Report, in accordance with the Public Health Act of Ontario.

When I accepted the position of Chairman of the Board, although I had been a member of the Board since its first organization, I did not fully realize the responsible duties pertaining to the office, and some of those duties I fear have been rather indifferently performed, especially after having been so ably attended to by my predecessor, Geo. C. Carlisle, Esq. Fortunately, however, we have been favoured with a season that has not required any very special attention.

The experience of the past year has convinced me of the necessity of having a Medical Health Officer in connection with the Board, who could be consulted at all times as occasion might require, thereby relieving the Chairman of a large share of responsibility in connection with cases that arise of which the latter may have no knowledge. That officer could be appointed without salary, and paid for services rendered during the year.

The question of compulsory vaccination will be taken up at the next regular meeting of the Board, in compliance with the request of the Provincial Board of Health. The City Council is still expending a large sum for drainage in different parts of the city, from which we expect to receive beneficial results in due time. The water commission is also extending the water supply over a large area, and citizens generally are getting alive to the necessity of having pure water. The impure water used from many of our wells is, no doubt, a serious cause of a large amount of sickness, yet it is surprising how owners of wells adhere to the idea that the well water is all right, and even go so far as to defy the Board to close them up. The work, however, is gradually going on, and numerous wells are being closed or disused. In some cases we have had the water analyzed, and when found bad have ordered the wells to be closed forthwith.

Our Board has requested the City Council to have erected a small building on the grounds of the General and Marine Hospital, for the purpose of isolating cases of contagious diseases—other than smallpox—that occur in families or hotels, where it becomes necessary to have the patients removed, thus affording a convenient place where such patients can receive the necessary care and nursing. The city pays a sum annually to the hospital for this and other purposes.

The statistics from report of city clerk show the death-rate from all sources, up to 15th Nov., 1888, to be 175, being a death-rate of 17.5 per 1,000. Deduct from this amount 43 deaths by accident, old age, etc., and there are only 142 deaths from natural causes, making actual death-rate 14.2 per 1,000.

The expense account of our Board will be inside of the appropriation of \$500. Three hundred and sixty of said sum is paid to the Sanitary Inspector, who performs his various and sometimes very unpleasant duties in a most efficient manner.

During the year there were 12 cases of typhoid, 13 of scarlatina, 63 of diphtheria, and 19 of measles.

SAMUEL G. DOBSON,
Chairman.

ST. THOMAS.

Medical Health Officer's Report.

As Medical Health Officer for the city of St. Thomas, I beg to report as follows :—

During the year ending Nov. 1st, the city has been remarkably free from disease, with the exception of scarlet fever and diphtheria. We have had 63 cases of scarlet fever without a single death; 32 cases of diphtheria and 3 deaths; 6 cases of typhoid fever and 1 death. Only 2 cases of measles were reported, and no deaths, making a total of 103 cases, with four deaths. Two of the cases of typhoid fever had contracted the disease before coming to this city.

Much has been done during the present year in improving the sanitary condition of the city by our efficient officer, the Sanitary Inspector. I have accompanied him on several occasions in the performance of his duties, and have rendered him all the assistance in my power. I consider the city in a better sanitary condition at the present time than it has been for several years past.

J. B. TWEEDALE, M.D.,
Medical Health Officer,

TORONTO.

Secretary's Report.

In accordance with the requirements of the Public Health Act, I have the honour to submit the annual report of the Local Board of Health of the city of Toronto for the year 1888.

The following is a synopsis of the work carried on during the year under the supervision and direction of the Board :—

The first step taken by the Board was to give the citizens the fullest information possible regarding the requirements of the Public Health Act. This was done by way of having large boards, with the most important extracts from the Act printed thereon, and the boards placed in very conspicuous places throughout the city.

A number of inspectors are employed by the Board, looking after the many complaints sent in to the Medical Health Officer. These inspectors are kept very busy and do their duty in a satisfactory manner. They are required to report from time to time what particular duties they have been engaged in, and such Report is at hand when called for by the Board.

Private Drains.—The attention of the Board having been called to the method of constructing private drains, the following order was passed and a copy transmitted to the city engineer, with instructions to rigidly enforce the law :—

“That from this time forth all private drains must be constructed in accordance with the by-law relating thereto.”

Since this order was passed, very few complaints have come to the knowledge of the members of the Board.

The Gaol.—On the 27th March, a report as to the sanitary condition of the above-named building was received from the Medical Health Officer. This report embodied a report from one of the city plumbing inspectors, clearly setting forth what was required to place the building in a better sanitary condition.

A lengthy letter from the Government Inspector of Prisons, also bearing on the subject, was received a short time after. These documents were referred to the Committee of the City Council, who have charge of the said institution, for consideration.

The matter was subsequently taken up in earnest, and an architect appointed to examine the building and prepare plans, etc., embodying as much as possible the recommendations set forth in the Medical Health Officer's and plumbing inspectors' reports.

Tenders were let, and the improvements are now well under way, and the Board hopes to be able to report before long that it is one of the best buildings of the kind in the city, so far as sanitary matters are concerned.

Inspection of Milk.—This important subject was first introduced to the Board this year by way of a circular from the Provincial Board of Health.

The Medical Health Officer drew up a report setting forth the necessity of having the dairies, creameries, etc., thoroughly inspected, but owing to the large amount of important business before the Board, the matter was left over for future consideration. Nothing further was done with the matter, and it is the wish of the Board that next year will see a rigid inspection carried out.

Ashbridge's Bay.—On March 27th, a large deputation waited upon the Board and asked its co-operation in furtherance of a scheme whereby the waters of Ashbridge's Bay could be made clean and more healthy.

They suggested the making of a cut at the east end of the bay, thereby connecting it with the lake, and thus allowing the polluted water and refuse which has for a long time been very detrimental to the health of the citizens residing in the locality to flow out into the lake.

The Board appointed a sub-committee of five of its members to examine into the whole matter, and consult with the city engineer, city commissioner, and all parties interested, with a view of bringing forward some feasible scheme for cleaning the water of the bay named.

This sub-committee reported that, after giving the locality a thorough inspection, both by land and water, and after carefully considering the whole matter, they had come to the conclusion that the only feasible scheme which could be undertaken with a view of good benefit was to make a cut at the eastern end of the bay right through to the lake, thereby joining the two waters, and with the proper winds, the refuse, etc., would flow out into the lake, while at the other end of the bay the fresh water would flow into the bay.

It was further suggested that the above works be commenced without delay, and be done by day labour, under the supervision of the city engineer and city commissioner.

The report of the sub-committee was adopted by the Board, and after procuring from the city engineer an estimate of the cost of carrying out the scheme to completion, the whole report was recommended to Council for adoption.

The Council, after considering the great necessity for the improvement, adopted the report in its entirety. The work was begun under the supervision of the city commissioner—large gangs of idle men were seeking work, and a number of them were given employment, some digging, others hauling and wheeling the sand, etc. After a good summer's work it has been completed in a very satisfactory manner, and in the short period since it has been completed, a very marked improvement can be noticed in the whole locality surrounding the bay. The winter having set in, of course very little water can flow in and out of the bay, but it is to be hoped that by this improvement the rush of foul water into the lake will continue until nothing remains on the city's eastern water front but a fine fresh body of water.

His Worship the Mayor, Ald. Drayton, the Chairman of the Board, and the City Commissioner have been indefatigable in their endeavours to see the scheme carried out successfully, and to those gentlemen a large amount of credit is due.

Drainage of Lanes.—The attention of the Board was directed to the very unsanitary condition of many of the lanes of our city; and as the Council have the right by by-law to take the initiative and lay down drains where required, on sanitary grounds, and assess the owners of the property immediately benefited for the cost thereof, it was a strong recommendation from the Board to the Committee on Works and City Engineer to have all the lanes of the city properly drained, so far as practicable, as soon as possible.

The Board learned with gratification that its recommendation to the Committee on Works has been extensively carried out, and where lane drains have been laid, a much better and healthier atmosphere is noticed in the locality.

It was the expressed desire of the members of the Board that this work should continue until every lane of the city was properly drained, as it had been proved that this is the proper way to drain all houses, instead of constructing the drain along under a house to connect the same with the street sewer.

Collection of Garbage.—The Medical Health Officer submitted a lengthy report on the above subject, and directed the attention of the Board to the great necessity for having the garbage of the city collected twice a week during the warm weather, instead of once as at present. From a sanitary point of view, the members of the Board thought the idea a first-class one, and a strong recommendation was sent to the Markets and Health Committee, who have charge of such matters, asking it, in the interest of the health of the citizens, to have a semi-weekly collection of garbage made during the summer months, and, further, that sufficient funds be placed in the Estimates for the purpose of carrying out the same.

The Markets and Health Committee subsequently adopted the recommendations of the Board and carried on the work as suggested.

That the idea was a success is evident from the fact that very few complaints, indeed if any, were heard of from the delay in the collection and disposition of garbage and refuse.

Island Conveniences.—The matter of providing conveniences for persons camping and residing on the Island during the summer months was considered by the Board, and an order was passed to the effect that the Property Committee be requested to take such steps as it may deem expedient to have proper conveniences placed at different points on the Island, for the use of the citizens generally, as well as the campers and residents thereon.

The Committee on Property presumably have dealt with the matter, as no complaints from the above cause have been reported to the Department.

Island Garbage and Refuse.—Two men have been employed all summer collecting the garbage and refuse on the Island. The garbage, when collected, was burnt up and buried, in order that it might not be a nuisance to the many citizens spending the day over on the Island. The result of such a scheme was remarkable, as not a complaint was heard throughout the summer. The Board hopes that this means of destroying the Island garbage, etc., will continue until some more feasible scheme can be adopted.

Inspection of Plumbing.—On the 4th of May, the Medical Health Officer informed the Board that, in accordance with the new Plumbing By-law, the plumbing inspectors had ceased to report to his Department and receive instructions therefrom.

The Board, after a careful consideration of the matter, decided to ask authority from the Council for the Chairman to introduce a Bill to amend the present by-law regulating plumbing, so that the inspectors shall attend and report on matters referred to them by the Medical Health Officer.

It is a matter of extreme regret that the Board has to report that the action of the Council in passing the Plumbing By-law, without making any reference therein to the Medical Health Officer, was most injurious to the health of the citizens, as a large number of matters were reported daily which require the attention of practical men, and as a result all such reports could only be dealt with to a certain degree, and then deferred and dropped.

It is not only expedient but requisite and necessary that the plumbing inspectors should report to the Medical Health Officer's Department on certain matters, and the Board hopes that such a provision will be made in the new by-law before being finally passed by the Council.

Closets and Urinals.—The Medical Health Officer informed the Board by letter that he had written the superintendents of the different railway companies asking that before the advent of warm weather the closets and urinals in connection with their respective stations and stopping places be properly cleaned and kept in a first-class sanitary condition. Subsequently, replies were received from the aforesaid representatives of the railway companies, stating that it would be attended to at once, and that no complaint could arise from any negligence on their part.

The Public Halls.—Some persons having directed the attention of the Medical Health Department to the insanitary condition of the public halls belonging to the city, the officer of that Department had a complete examination of the said halls made in order that the cause of complaint might be properly located and report made as to what was necessary to remedy the evil complained of.

The report was received by the Board, as it was thought that in the interest of the health of the many persons using the said halls something should be done to make complaints impossible, and a request was forwarded to the Property Committee, who have charge of the same, to the effect that a thorough overhauling was necessary of the city's halls in view of the complaints made.

Supply of Milk.—The Medical Health Officer wrote asking the Board for instructions in the matter of obtaining permits by those persons dealing in milk in accordance with the requirements of the Health Act, and the Board gave him positive instructions to strictly enforce the Act so far as the same relates to the supply of milk in this city.

Inspection of Factories, etc.—This very important subject received considerable attention at the hands of the Medical Health Department, and a lengthy report thereon was submitted to the Board. The report stated that 278 establishments had been inspected, and 210 of the same were found to be in first-class sanitary condition, the balance, 68, have more or less been placed in a better condition, and very few complaints have been made as to unhealthiness, etc.

A large number of private dwellings have been inspected and found more or less in a sanitary condition. Many dwelling houses have not as yet done away with the old-fashioned and very unhealthy privy-pits, and, as a matter of course, any place with such a nuisance as this in the neighbourhood must necessarily be unhealthy to the residents.

The citizens are gradually being educated into the necessity of closing up all privy-pits, and before many months very few will be located in the centre of the city.

The City Water Front.—This very important matter has engaged the attention of the Board, and a lengthy report bearing upon the subject was received from the Medical Health Officer. After giving the matter considerable attention, a sub-committee of the Board, together with the Medical Health Officer and the City Commissioner, was appointed to take immediate action in the premises, and authority was granted the chairman to hire a dredge and have the important slips dredged and cleaned with all possible despatch.

Dredging was carried on for many days, and the large quantity of most filthy sewage—disease breeder—taken from the slips was enough to disgrace any city.

That the action of the Board in having the above work done with so little delay was approved of, could be learned from many citizens.

There is only one way whereby all this dredging and cleaning, as well as annoyance and inconvenience could be done away with, and that is by having the mouths of the sewers emptying into the slips extended out to the ends of the wharves, where they could get a clear passage and better working.

By this improvement the many disgraceful scenes at present noticed in our important slips will be avoided, and the Board strongly recommend the immediate action of the Council in having such a scheme carried out.

The cost of dredging being very high, in comparison with the cost of purchasing a dredge, the Board strongly recommended to the Council the purchase of one, as its use will be required more or less throughout the season.

Public Abattoirs.—The attention of the Board was directed to the great necessity of establishing a public abattoir within the limits of the city, thereby doing away with those disease-breeding places known as slaughter-houses. A committee of the Council has taken the matter up and are looking after information on the subject, as to the cost of working, etc.

This, if established, will, no doubt, be a step in the right direction.

Cat Fish Pond.—A number of residents in the vicinity of High Park waited on the Board in reference to the unsanitary condition of the above named pond. They claimed that the said pond in its present state was most injurious to the health of those residing round about. The Medical Health Officer submitted a report on the subject, and recommended certain improvements to the same. After hearing the report read, the whole matter, with all documents referring thereto, was referred to the Property Committee for consideration, with a suggestion that a proper survey of the locality be made, and that the place be thoroughly inspected with a view of bringing forward some feasible scheme whereby this much desired improvement might be carried out. The matter has been before the Property Committee, and as it is not yet determined what plan will be carried out, consideration of the same will have to be continued next year.

Consumption of Smoke.—This question has engaged the attention of the Board this year. A sub-committee was appointed to meet and confer with a sub-committee of the Markets and Health Committee, with a view of adopting some scheme whereby the vast quantities of smoke arising from factories and large manufacturing places might be consumed. The joint sub-committees have not held a meeting yet, hence the matter stands. It is the desire of the Board that this matter should not be allowed to drop, but that consideration be carried on until something is accomplished.

Narrow Streets.—The Board received a communication from the Assistant City Engineer, drawing attention to the practice of subdividing lots in the area between Yong street and the Don, and Front street and Carleton street, in rear of other houses, or cutting up lots with streets only thirty feet wide, contrary to the provisions of the statute governing the same, thereby forming a hot-bed of infection for the spread of disease and epidemic. The attention of the Board of Works was subsequently directed to the practice, and the Board earnestly hope to see a prevention of such an unsanitary evil strictly adhered to.

Privy-pits, Wells and Cisterns.—The Medical Health Officer brought before the Board a report setting forth the great necessity of having the law amended, giving power to his Department to order the closing up of all privy-pits, wells and cisterns forthwith, these places being very detrimental to the health of people residing where they are located, any number of cases of sickness having been caused by their existence.

The recommendation was approved of and will have to be considered again at an early day.

Smallpox Hospital.—The Board have received, from time to time, many letters and petitions praying for the removal of the above named institution from its present location on Broadview avenue to some place more suitable for the same. A committee of the council has considered the question and recommend the removal of the institution with all possible despatch, but the Board, while anxious to comply with the wishes of the people as much as possible, could not at the present time see a more suitable location for such an institution; and as it must necessarily be located somewhere in the city, it is very likely wherever it is placed there would be the usual outcry for its removal.

Public Health Act.—The Board, after viewing the many difficulties which have arisen from time to time in the enforcement of the Public Health Act, appointed a sub-committee to consider and report what legislation is requisite in order that better work may be accomplished in the Medical Health Department. The sub-committee has not yet reported the result of their deliberations, but it is expected they will do so shortly.

Free Vaccination.—Free vaccination has been carried on during the year very extensively. The employees of many of the large establishments and factories have submitted to vaccination, and it is considered that this action was a very wise one, as there is no doubt but that such a proceeding helped very much to prevent the spread of the smallpox.

Garbage Destructor.—The attention of the Board was again directed to the great necessity of having one or more furnaces or crematories constructed for the purpose of

destroying the large amount of garbage collected throughout the summer annually. This is a very serious matter, and the Board has considered and recommended the establishment of some machine for the purpose named.

The council last year adopted the proposition, and have gone so far as to provide money to pay the cost of constructing some such machine, but there the matter now stands. It is to be hoped that before any great period passes by, one, at least, of these machines will be constructed and tried, and if found to work satisfactorily, another can be erected. Next year's Board should do all in its power to have a scheme brought forward and adopted.

Ice Cutting.—Last year's Board adopted certain restrictions as to the places where ice would be allowed to be taken from the Bay, and the result of said restrictions has resulted very beneficially to the health of the citizens using ice for drinking and such like purposes. The Board have this year adopted the same restrictions, and have instructed the proper officers to strictly enforce the same.

Sanitary Police.—The Police Department detailed four of their men for special sanitary inspection duty, and the result of their labour has been very beneficial to the city at large.

In conclusion it must be mentioned that the members of the Board have worked faithfully and well during the year, and have done all in their power to carry out its duties to benefit the citizens of this vast and growing city. The Chairman, Alderman Drayton, has been most assiduous in the discharge of his duties, and it is to that gentleman, to a very great extent, that the successful working of the Medical Health Department is due. A great amount of good work has yet to be accomplished, and it is to be hoped that next year's Board will endeavour to carry out the same.

JOHN BLEVINS,
Secretary.

In the report of the Medical Health Officer to the Local Board, he states that the number of diphtheria cases reported for the year was 490, but he does not give the number of deaths.—[Ed. Reports].

TOWNS.

BARRIE.

Chairman's Report.

A careful inspection of all the places in the municipality where filth usually accumulates was made during the month of April by the Sanitary Inspector, aided by members of the Board, resulting in a general cleaning up. The removal of certain piggeries and the plentiful use of deodorising material placed the town in a fair sanitary condition, considering the absence of a general or complete system of sewerage.

A greater number of cases of serious sickness have occurred than during any of the past few years; amongst the number were several cases of typhoid, mostly contracted elsewhere, some resulting fatally. Diphtheria also prevailed, but to a less extent, its victims being children.

With those exceptions the health of the town has been normal.

R. KING, SR.,
Chairman.

BROCKVILLE.

Medical Health Officer's Report.

In compliance with the requirements of the Public Health Act, I beg leave to submit the following report of the sanitary condition of the town of Brockville:—

As my appointment to this office dates from April, 1888, I am able only to speak of what has been done during the past six months.

During the early part of the summer an unusual amount of diarrhoea made its appearance in the town, and gave rise to reasonable suspicion as to the purity of the water used for drinking purposes; an investigation into the condition of the inlet pipe and well of the waterworks was ordered by the town authorities, and conducted under the supervision of the chairman of the Board of Health, the chairman of the waterworks company, the town sanitary engineer and myself. One connection was found to be imperfect, and one length of pipe near outer end slightly broken. The well was found to be perfectly tight and clean. The waterworks company promptly remedied these defects, and no complaints regarding the quality of the water have been made since that time.

During the past two months typhoid and typho-malarial fevers have been very prevalent.

The medical practitioners of the town have cheerfully carried out the provisions of the health by-law, and have sent in returns of all contagious and infectious diseases occurring amongst their patients; these returns have been carefully tabulated by the secretary of the Board of Health, and infected houses immediately placarded. Notices were served on the teachers of schools attended by children from these houses, to exclude them from the school until a card is received from the attending physician that recovery has taken place and that the house has been properly disinfected; a similar notice was served by the Sanitary Inspector on the librarian of the Mechanics' Institute library, and no books were issued to inmates of such infected houses, and those books which have been exposed to infection are properly disinfected before being again put into circulation.

By the strict observance of these regulations we have been able to reduce the number of cases of infectious diseases to a minimum, there having been only seven cases of scarlet fever and five cases of diphtheria reported up to the present date.

As I have stated, the presence of typhoid and typho-malarial fevers in Brockville this summer has been very marked. The connection of typhoid fever with the excremental pollution of drinking water is well known; this results from the soakage of water through soil charged with sewage.

This is not surprising when we consider how little care is exercised to prevent the filth from privies and old drains from finding its way into the wells used for drinking purposes. Some late authorities assert that not only will water contaminated with sewage containing typhoid dejections cause typhoid fever, but water polluted by sewage can disseminate the diseases independently of typhoid excreta.

This was so evidently the case in connection with the water used from a public well on King street, east, where five cases of fever were distinctly traceable to its uses—that the Board of Health, acting on my advice, closed the well. No new cases have developed in that vicinity.

I would strongly recommend to the consideration of this Board the question of the advisability of closing up all the public wells, as I believe the water supplied by them is to be regarded with the gravest suspicion.

Perhaps more has been done this year towards a systematic cleaning and disinfecting of privies than ever before; and yet, I am aware, that very little good has as yet been accomplished. The health by-law provides that this yearly cleaning be done on or before the 15th day of May; parties interested take advantage of this clause and leave for the 15th of May what should have been done in the winter months. I would respectfully suggest that the by-law be so altered or amended as to enable the Board of Health to order a systematic cleaning of all privies, beginning from the 15th day of November and extending to the 15th day of June.

By this means the town can be divided up into blocks and the work done in a thorough and intelligent manner.

Milk being one of the necessities of life, its value in respect of the amount of butter and its other constituents, becomes of great importance to society, since it forms almost the entire food of invalids, and children at that period when they are the least able to withstand any interference with the purity of their food; there is, however, no one article that is so frequently adulterated or sold in an impure condition.

Whilst the prevention of adulteration is important, we should go still further and check the sale of milk that is impure in other ways; and if the best interests of the public are to be protected, it is absolutely necessary that the condition of the animals producing it, and their surroundings, be rigidly inspected. For the carrying out of this end it is necessary that permits for the sale of milk should be granted to such vendors as are willing to enter into an agreement to furnish the Board of Health with every facility for examining into the workings of their dairies; and, also, immediately to report any disease existing either in their homes or amongst their cattle. These permits and agreements are printed and ready for use whenever the town council sees fit to pass a by-law authorising the same. The law suffices to enable the health officers to prevent the adulteration of milk offered for sale, and an inspection and report will be made from time to time.

I wish to bring before your notice the advisability of purchasing, on the outskirts of the town, a suitable lot on which could be erected a pest-house.

Our town has been mercifully preserved from any need of such a place during the past two years, but to be ready for any contingency is surely the part of wisdom; and by having suitable preparations made, much danger to life and expense to the municipality might be avoided.

The drainage of our town is, as you are aware, making very satisfactory progress; it is unnecessary for me to make any special or lengthy allusion to it. The excellent system adopted, and the careful manner in which every part of the work is supervised and carried out, leaves nothing to be desired. All plumbers are licensed, all plumbing inspected, and no connections are allowed to be made with the sewers until all has been done that scientific knowledge can suggest to render our homes free from the invasion of disease.

During my short term of office I have received very great assistance from the Sanitary Inspector—Chief Mitchell.

We have, together, investigated every case of complaint entered in the "complaint book."

The Inspector informs me that he has inspected 268 yards, and has ordered closets cleaned to the number of 208.

HARRY E. VAUX, M.D.,
Medical Health Officer.

CHATHAM.

Medical Health Officer's Report.

In presenting my annual report for the year terminating November 15, 1888, allow me to congratulate you on the very excellent and useful work done by the Board, and thank you for the prompt action you have always taken on matters brought to your notice.

The following is a summary of the preventable diseases that have occurred in town during the year: Typhoid fever, fifteen cases, one death; diphtheria, twenty-seven cases, five deaths; scarlet fever, twenty-one cases, three deaths; measles, four cases. Total, sixty-eight cases of preventable diseases, causing the loss of nine lives.

The physicians of the town, recognizing as they do the importance of promptly reporting cases, and the inspector's daily call on each of them, has served to make the reports to this office almost perfect.

The inspector personally now attends himself to the disinfection of all the premises where contagious diseases occur. From investigations I feel convinced that the last outbreak of diphtheria in the town was imported from the country, where the system of reporting, placarding and disinfecting is seldom if ever enforced.

If an arrangement could be made with the four adjoining townships so as to form one large health district, it would be very greatly to the advantage of all concerned. You have already, by their consent, supervision over the slaughter houses adjoining the town, which will undoubtedly be a great advantage to you in the struggle against preventable diseases. The inspector ordered the cleaning of 565 privy vaults during the year, while thirty permits were granted for the erection of new water-tight closets. Thirty licenses were granted for milk vending. All the dairies were visited by the inspector and myself during the year at least once, in many cases oftener, when the condition of their premises, cow-byres etc., were carefully looked into: also the methods of handling milk, etc., and suggestions made to the dairymen where improved methods were advantageous.

During the year the town council granted sufficient money to purchase a complete set of apparatus for testing milk; they also passed a by-law for the regulation of the sale, quality, etc., and empowered the health officer and inspector to carry out its provisions. Since the purchase of these instruments I have submitted thirty-seven samples to the various tests (in some cases three or four samples from the same vendor), and found that, in a large number of cases, the samples were not standard milk; but I find that the samples last examined were much better than the first. So far we can confidently state the apparatus has been an advantage to the consumer, and will undoubtedly be a greater one after a few parties who persist in adulterating milk will have been prosecuted. The pestiferous hog has been very much complained of by the citizens, and I find that clause 14, rule 7, schedule A, of "The Public Health Act," is not sufficient to cope with the nuisance of hogs in this part of Canada where the winters are so open. If the regulations of the Act were made operative all the year round the nuisance would be far less.

The disposal of kitchen garbage has given rise to considerable trouble to the inspector, and is a nuisance to many citizens. On one street in particular, householders got into the habit of dumping garbage at night in front of a neighbour's house, and the practice became so universal that almost every householder on the street would find a heap of garbage in front of his residence in the morning. The Inspector left a notice at each house on the street warning them to stop the nuisance; he also called their attention to the easy method of disposing of kitchen garbage by burning. The practice has since stopped.

The landlords were notified to supply their tenants with proper water-closet accommodation, and at once complied. All the several nuisances complained of, as recorded in the book for that purpose, were looked into and abated when we thought we had power, but several were of such a nature that they were, properly speaking, merely annoyances rather than nuisances to public health, and we had no power to remedy them. We take great satisfaction in stating that we were ably seconded by citizens of the town, and it was not found necessary in any case to have resort to the law courts.

WM. R. HALL, M.D.,
Medical Health Officer.

COLLINGWOOD.

Secretary's Report.

In compliance with your printed circular of the 9th ultimo, I herewith forward report of the sanitary condition of the town during the past year.

The question of water works, which are an absolute necessity from a sanitary standpoint, is now agitating the public mind of this town, a by-law for the purpose having been submitted by the council, and will be voted on next month. I trust this will meet with the approval of the electors.

We have had the following cases of infectious and contagious diseases :— Group membranous, thirteen cases ; diphtheria, twenty-one cases and one death ; fever enteric, seven-ten cases ; measles, four cases ; scarlatina, nine ; whooping cough, 125.

There has been no serious outbreak of any contagious disease during the year, and apparently no necessity for any active work by the Local Board of Health.

There is no regularly appointed medical health officer in the town.

JOHN HOGG,
Secretary.

DUNDAS.

Medical Health Officer's Report.

During the past year there have been quite a number of cases of infectious diseases within the limits of the town. Diphtheria made its appearance just about twelve months ago, and during the next few months a good many cases occurred, these cases being distributed over nine or ten families. Three of these families occupied adjacent dwellings, and the disease spread from one to the others, but with this exception they were widely separated, and it is probable that the infection was not carried from one family to another in the town. A few cases of measles occurred, how many cannot be stated, as they were not reported. Rôtheln was epidemic in the spring, and but little attention was paid to it in most cases. No cases were reported by medical men. Of typhoid fever there have been a number of cases, but the disease has not been prevalent. Malaria has shown its influence in much the usual way. There was comparatively little of the diarrhoea from which children, particularly, usually suffer so much in the latter part of summer, this immunity being due partly to the fact that there was no lengthy period of high temperatures.

In a general way, the sanitary condition of the town has been good, especially during the summer and fall months. The few cases of typhoid that have occurred have been in groups for the most part, and that the cause has been unwholesome water, there seems little doubt. The necessity for a further supply of wholesome drinking water still exists. It is to be hoped that the steps taken towards this end by the municipal council will be successfully followed up. The want of water that can be relied on as good, is, perhaps, the most unfavourable condition—among those that are preventable—from a sanitary point of view, in which the people of the town are placed.

JAMES ROSS, M.D.,
Medical Health Officer.

Chairman's Report.

In accordance with the terms of the Act, every property holder within the corporation has been duly notified as to the cleaning of vaults, drains, and cesspools, and the same has been promptly carried out under the direction of the Health Officer during the summer. Several complaints of open drains and cesspools which were detrimental to health were received, but in every instance these were, upon proper notification to the parties concerned, put in good repair. The Board have, for two or three years back, notified your council to keep on hand a supply of copperas, so that vaults should be disinfected immediately after cleaning. We find that, owing to the liberal use of copperas, typhoid fever in Dundas was very much reduced. The Board would also urge upon you the question of sewage, as it is evident that all liquid matter thrown out must either sink into the ground and pollute the wells in time, or remain in cesspools and contaminate the air. We consider this of vital importance, as the town in another year will have the best water supply in Canada ; and the introduction of water services to householders will necessitate some system of drainage.

JOHN BERTRAM,
Chairman.

GALT.

Medical Health Officer's Report.

In making this my fourth annual Report, I am glad to say that the town shows a lessening of the death-rate and a freedom from outside epidemics, and a lower rate of infectious diseases than the majority of towns in the Province. This, I think, may be accounted for by the thorough work done by our Inspector, and a general desire of the inhabitants to assist him and the Board in carrying out instructions. Though yet imperfect, I hope the time is not far distant when we may be in a better condition to carry out and enforce the Public Health Act. I would suggest to this Board having some appointed place that the Inspector could be found, and certain hours made known that any grievance the public may have, he will be in a position to take action. As things now exist he is hard to find. Numerous complaints have been made to me through the year of families throwing slops at their back doors, especially during the winter when frozen snow and ice accumulate in large quantities and become very objectionable in the spring. I recognize the fact that it is hard to overcome this difficulty, when we have no system of sewerage to carry off this matter; and until a proper system of water works and sewerage is adopted, this grievance will continue to exist.

During the year there has been twenty-eight cases of diphtheria reported, with only two deaths, which shows that it was not of a malignant type.

Seventy-three cases of typhoid fever spread over the whole year with only four deaths. The many rumors connected with the existence of this disease led the public to suppose that hundreds of cases existed around them, and in the town. The truth of the matter is we have not had the usual number of cases as in former years, nor in the average as much as other towns of similar size.

There has been a few sporadic cases of scarlet fever and measles, but not epidemic in character and of a very mild type.

I cannot close my report without expressing my regret at the action taken by some persons in the municipality regarding the hospital by-law, but hope and trust that all obstacles will soon be removed, and by the end of another year the building will be completed and properly equipped to receive the many that now have to be sent out of town for proper care and treatment.

G. P. SYLVESTER, M.D.,
Medical Health Officer.

KINCARDINE.

Medical Health Officer's Report.

I beg leave to report that the general health of the town has been fair.

There have been forty-eight cases of diarrhoea caused principally by the excessive heat of past summer, and confined exclusively to children under twelve; three cases of very mild typhoid; four cases of diphtheria—mild, one adult and three children; six cases of cholera morbus; two of intermittent fever—mild.

There have been no complaints of nuisances within the corporation and everything is satisfactory.

BENJ. WALDEN, M.D.,
Medical Health Officer.

LINDSAY.

Chairman's Report.

The first important matter brought under the notice of the Local Board of Health occurred on the thirty-first of January: it was reported that a young man, Hugh Graham, who had been working in a shanty north of Kinmount, had come to Lindsay

on that date, and that he was then suffering from a malignant attack of diphtheria, and that he reported to the Town Physician that he had been under treatment by Dr. Frost, at Kinmount, who, he said, told him that "he had better get on to Lindsay." Graham at the time produced a bottle containing medicine prepared by Dr. Frost. The young man being comparatively a stranger in town, very ill and indigent, was taken charge of by the town authorities with a view of getting medical treatment and preventing the spread of the disease under which he was suffering.

He was placed under charge of the gentleman employed by the municipality to afford medicine and attendance to the poor and indigent of the town. At a serious expense to the town of Lindsay a house had to be rented and furnished and supplied with food, fuel and attendance until he was reported sufficiently well to go to his native village, Newcastle.

Acting on the statement made by Graham, information was laid against Dr. Frost for contravention of the Ontario Public Health Act, and the matter investigated by the Police Magistrate of the town of Lindsay, which investigation resulted in the dismissal of the charge without costs.

The necessary precautions as to detention and thorough disinfection of the coach in which Graham travelled was promptly attended to.

The system of sewerage of the town of Lindsay is on the whole defective. There is a main or trunk sewer running through part of Kent street, which was constructed some years ago for the drainage of the street and cellars on each side of it, but not intended to be used as an outlet for offensive slops or the soil from water closets. The closets at one time connected with the sewer have been cut off, and the sewer is now used only for the purpose for which it was originally constructed. Complaints having been made that offensive odours came from the opening of the sewer, we caused about half a bushel of dry charcoal to be suspended under the grating, and poured liberal quantities of Littles' soluble phenyle in through the gratings, the application of which remedies has materially mitigated the evil complained of, and has been the means of saving a large expense in periodical flushing of the sewers.

On the recommendation of the Board the council purchased, early in the present year, an acre and a half of land well situated, as a "dumping ground" for the reception of offensive accumulations. Decaying animal matter is buried in this piece of land, and deep trenches dug for the reception and covering in of the soil removed from closets. The place is well removed from the centre of population, and with ordinary supervision has afforded and will continue to afford great accommodation to the public.

The health of the town has been fairly good. Appended hereto is a statement taken from the books of the Medical Health Officer of all contagious diseases reported.

The only serious cases which the Board has to bring to notice, are those of Mr. King who resides in the South Ward. In October diphtheria made its appearance in his family, six of whom were attacked of which four terminated fatally. Another case occurred in the family of Mr. Leary in the East Ward, one case terminating fatally; but with the prompt removal of the family to a temporary residence down the river, the disease was easily stamped out so far as Mr. Leary's family was concerned. The necessary precautions as to placarding have been adopted; and in all cases in which contagious diseases existed, the children from suspected localities were temporarily prevented from attending the public schools.

The Board have to express its sincere regret that some ten weeks ago Dr. Coulter, Medical Health Officer, was visited with a serious attack of diphtheria and is still so debilitated as to render him unfit for immediate duty.

His duties have been performed by Dr. Poole, who attends to the important department of Medical Health Officer with his usual zeal, courtesy and decision of character, as well as that of an accomplished sanitarian.

The Board beg to point out that the deaths reported in the town of Lindsay during the present year amount to only forty-eight from all causes, or 48-6000 of the estimated population; and as the great majority of such deaths are attributable to old age and natural decay, the town may be fairly classified as one of the healthiest in the Province of Ontario.

In the month of August of the present year this town had a visit from the Association of Executive Health Officers of the Province of Ontario, which body was accompanied by Dr. Hewitt, President of the American Public Health Association, Drs. Rae and Lachapelle, Presidents of the Provincial Boards of the Provinces of Ontario and Quebec respectively, and other well-known sanitarians. Their deliberations lasted three days, during which very important papers were read and discussed.

The sanitary business of the town has been fairly attended to, and it is very noticeable that the people generally are getting well reconciled to the sanitary supervision prescribed by the laws of the Province.

Cases of disease reported to the Medical Health Officer:—Measles, 86 ; diphtheria, 14 ; scarlet fever, 4 ; whooping cough, 8 ; chicken pox, 1 ; typhoid fever, 2.

JAMES DEACON,
Chairman.

MEAFORD.

Medical Health Officer's Report.

The health of the public in this municipality for the current year has been fairly good. No epidemic of any kind has visited this section.

Eight cases of fever of a markedly typhoid type have occurred in all during the year, but of those four were importations, the disease having without doubt been contracted elsewhere.

Three of the cases proved fatal, that is, of those who contracted the disease elsewhere, and two of those who contracted it in this town also died. The fatal results were chiefly attributable to accidental complications rather than to any intrinsic severity in the form of the disease itself.

No cases of diphtheria, small-pox, scarlet fever, or any other infectious disease except the one above-mentioned have been reported.

As regards the sanitary arrangements of the town, the removal of sewage and excreta is done chiefly by means of private drains, and in the thickest populated part of the town the water closets are for the most part provided with water-tight sliding box drawers, after the manner of the dry earth closet system. It is proposed to extend this system, which has been in operation several years, and to perfect it as far as possible.

As regards the prevailing types of disease met with in this locality, it may be said that catarrhal affections of the respiratory passages are exceedingly common, particularly in autumn and spring. The damp and changeable climate, and the fact that in the spring the ice most generally remains long upon the bay, probably conduce to the prevalence of the above-mentioned maladies among the people. Acute and chronic rheumatic affections and neuralgias are also quite frequent, and it is probable that their exciting cause is often in common with that of the other group of diseases.

In other respects this section may be regarded as very healthy, the air being exceedingly pure and bracing, and entirely free from malarial influence. The water springs are abundant and excellent, while the rolling character of the land in the locality round conduce to natural drainage.

All the known methods of disinfection and precautions employed for the purpose of preventing the spread of disease, in the cases of typhoid, have been applied.

C. F. SNELGROVE, M.D.,
Medical Health Officer.

MILTON.

Chairman's Report.

The Board of Health of the Town of Milton present their report for the year 1888:

The Board held five sittings during the year, at which the various complaints made were dealt with.

As the Board has no Medical Health Officer to report any cases of disease which may be prevalent, they have relied upon what they could gather from observation and other sources, and are pleased to report that the state of the public health of the town for the past year has been comparatively good.

Two cases of diphtheria came under the notice of the Board, one being of a malignant type and proved fatal, but from neither of those cases did the disease spread.

There were several cases of typho-malaria in the town which may have originated from various causes, none of which terminated fatally.

There were complaints made of unsavory odours proceeding from the tannery and from refuse matter therefrom, which were abated after the Board investigated the same.

The Board would call the attention of the council to the necessity of procuring some place to which waste refuse matter and garbage could be taken from yards, lanes and alleys, and burned, the attention of the Board being frequently called to the amount of such matter which has accumulated in some of the yards of business places.

They would also urge upon the council the necessity of proceeding to have the slaughter houses removed from within the limits of the corporation, as those places have been and still are of very great offence to those who reside in the vicinity of the same.

The Board would report their recognition of the great need there is of a better sanitary system of disposing of excreta than at present exists, and would urge the abandonment of the system of cesspools, and the adoption of a system of ash or dry-earth closets. Owing to the increasing population, and the use of the present system, the water in many wells in the town will naturally become impure and dangerous to public health.

SAMUEL DICE,
Chairman.

MOUNT FOREST.

Secretary's Report.

In the early part of the summer our sanitary inspector made a thorough inspection of the town, visiting all the back yards and other places which might require looking after, and promptly notified all parties to clean up and purify their premises. It has not been necessary this year to impose a fine upon any of our townspeople for breach of the sanitary laws.

The only cases reported to me were two cases this fall of diphtheria.

We have no medical health officer.

W. C. PERRY,
Secretary.

NAPANEE.

Secretary's Report.

In presenting this my annual report of the work of the Board of Health for this municipality for the current year, I have very great pleasure in stating that in consequence of the almost entire absence of contagion and the general healthy state of the town, the

duties of the Board were rendered comparatively light. The Board held several meetings at stated times during the year. At a meeting in April the usual notices were placarded throughout the municipality, for the cleansing of premises and the removal of all garbage and other deposits endangering the public health, which, under the supervision and vigilance of an efficient sanitary officer, were well observed and thoroughly carried into effect, and the town placed in a satisfactory sanitary condition.

The sanitary officer made periodical tours of inspection of the municipality, a report of which was submitted to the board at each meeting for its consideration. Any violations of the provisions of the Public Health Act discovered were immediately ordered to be remedied in the proper way.

Eight cases of diphtheria and one of measles were reported; no deaths. In each case the usual means were employed for isolation, and the prevention of the further spread of the disease.

There was constructed during the season some additional sewerage, which, no doubt, will have a beneficial effect in improving the sanitary condition of the town. The existence of a building within the town limits, used as a slaughter-house, was a source of annoyance to the Board by the frequent complaints of the disagreeable and offensive odors emitted therefrom. The proprietor failing to comply with the authority and direction of the Board, the nuisance was speedily removed by its subsequent and mysterious destruction by fire. As a matter of economy the Council have this year dispensed with the services of a medical health officer.

PHILIP EMBURY,
Secretary.

NIAGARA FALLS.

Secretary's Report.

The town has been free from epidemic diseases, and the public health is good. Owing to the prevalence of small-pox in Buffalo and in Tonawanda (ten miles distant), and this place being situated on one of the highways of railway travel from Buffalo, compulsory vaccination has been resorted to, and about one thousand persons have been vaccinated; in fact, most every one who was not vaccinated some few years ago at the time of the Montreal epidemic. There has been no small-pox among the people of this town, and the Local Board of Health don't intend there shall be, if vaccination will prevent it.

The need of better sewerage is felt here, and it is gratifying to report that the need is being met in a measure by the putting in of properly constructed tile drains on several streets.

J. ROBINSON,
Secretary.

ORANGEVILLE.

Medical Health Officer's Report.

Owing to the continued neglect in furnishing detailed reports on the part of householders and physicians, I am able merely to give a general outline of the diseases prevalent during the season of 1888, together with a few brief remarks relating thereto. Until municipalities realize the importance of making an appropriation to defray cost of sanitary work, and of providing an efficient system of house to house inspection, the process of sanitation will be imperfectly performed. Unless vigorous measures are adopted early in the season, such diseases as typhoid fever and diphtheria will continue to exist throughout the whole year. This has been the case in this municipality, outbreaks, more or less severe, of diphtheria occurring at intervals excepting during the hotter and drier periods.

The month of January was characterized by numerous cases of an affection known as lacunar tonsillitis, merging now and then into scattered cases of true diphtheria. Pneumonia also prevailed to a considerable extent during the same month.

Towards the latter part of March measles of an ordinary type made its appearance. Children belonging to infected households were suspended, and the epidemic gradually subsided; but not until well on in May.

Numerous cases of diphtheria occurred in April, some of which were fatal.

The month of June, ordinarily marked by but few cases requiring medical attendance, was peculiar in that measles and diphtheria were both rife throughout the month.

Scattered cases of diphtheria continued to crop out during July. I duly instructed the Sanitary Inspector to see that all wells should be cleaned out. I have reason to know that the law in this respect was "more honored in the breach than in the observance."

August, which is usually counted as one of the unhealthy months, was remarkable for the absence of much general disease. I was requested by the Public School Inspector to report on the suitability of the premises on the corner of P. W. road and Zina street, for the purpose of a ward school. After a careful examination of the rooms proposed to be used, I reported adversely, owing to the imperfect provisions for ventilation and the poor lighting facilities.

In September a few cases of malarial and typhoid fever occurred, but so far as I am aware all ended in recovery. Several deaths from diphtheria took place in this month, and fears were entertained lest it should become necessary to close the public schools.

In several instances criminal carelessness prevailed as to isolation of infected patients and families. There is but one remedy for this, in my opinion, namely, summons the offenders and fine them as heavily as the law permits.

In conclusion, allow me to say that so long as the town neglects to provide proper sewerage and permits the multiplication of privy-vaults, while its inhabitants depend on wells for their supply of the life-giving (and in such cases *death-dealing*) beverage, so long will we be ravaged by diphtheria and fever, and shunned by visitors and those who would otherwise cast in their lot with us.

Moreover, I must refer to the wonderful small number of children protected by vaccination attending our schools.

I am not aware that any steps were taken by the board to carry out my suggestions in regard to the milk supply furnished by our dairymen.

When the recommendations of a Medical Health Officer are ignored, when a board cannot be persuaded to meet regularly, and when a Council neglects to fill vacancies in the Board created by death and illness, then it is indeed difficult to see what benefits can be obtained from any such farcical compliance (or rather non-compliance) with the Public Health Act.

CHAS. M. SMITH, M.D.,

Medical Health Officer.

PETERBOROUGH.

Medical Health Officer's Report.

The present year has been the least eventful of all the years since the passing of the Public Health Act. No outside epidemic has visited the town; there has been a much less proportion of typhoid fever, diphtheria and scarlet fever, not so large a number of complaints as in previous years, and a better compliance with the Statutes than heretofore. No better evidence of this could be given than the steadily decreasing death-rate. In 1885 this was $18\frac{1}{2}$ in the thousand; in 1886, 18; in 1887, 17, and during the present year only a shade above 16. These are striking figures. To give another view, a difference of 2 per thousand in the death-rate of a town the size of Peterborough means a saving in ten years of nearly 200 lives. High sanitary authorities have given 17 per thousand as a standard

to be aimed at. Peterborough has gone beyond this, and may therefore be pronounced one of the healthiest towns in the world. No better recommendation to manufacturers looking for a place to locate, or private parties looking for a town to settle in, could be given than to say that the death-rate here is only 16 per thousand.

Slaughter Houses.—Regular inspections of slaughter houses have been made, and notices served when necessary. More rain having fallen this summer than last, it was found that greater care was needed in cleaning up. The butchers now render their tallow every day or two, instead of keeping it two or three weeks. This lessens the disagreeable odor of that process. I may here correct a popular error as to the unhealthy nature of these fumes. They are certainly highly unpleasant, but not dangerous from a sanitary point of view.

Removal of Garbage and Excreta.—This has become a regular business, and quite a number of men are engaged in it. As in other years the greatest difficulty has been found in the rear of certain stores on George street, where the constant presence of a sanitary inspector would hardly keep things right. We have also had difficulty in disputed lanes where garbage is deposited, it is difficult to tell by whom. I think a couple of men from the street force should be detailed at stated times to clean them up. These are the places that attract attention, and, if ill-kept, give a bad name to our town. Manure heaps are sometimes allowed to attain larger proportions than the law permits. It should be remembered that not more than a waggon load in one place may accumulate without being removed. In many yards heaps of rubbish, such as ashes, scrap, metal, chips, etc., not dangerous to the public health, may be found. The health statute does not cover such cases, except in the spring of the year when refuse of all kinds must be removed before the 15th of May. I will again call the attention of the public to this matter at the proper time. Some try to evade the section relating to the cleaning of water-closets, but on the whole there is much more work done each year. Earth-closets make rather slow progress. If well kept they are a great boon, but if faulty in construction and not emptied regularly, they are worse than the old privy-vault.

A Word as to Sewerage.—It seems to me that this is a matter for the Dominion or Provincial authorities to take up. It affects not only our town but scores of similar towns springing up all over the country. For a place even to ascertain the best method of sewerage, is not only an expensive matter but a difficult question in the face of conflicting systems. Sewage farms seem to be making headway at present. Let the matter be investigated thoroughly and decided once for all by the central authority, and towns can adopt the system it recommends modified only to suit the particular necessities. Agricultural legislation is being constantly made by both Governments for the benefit of the farmers, and I don't see why sewerage investigations should not be carried on for the benefit of those living in towns and cities. At any rate the question might be looked into by our Parliamentary representatives.

Regarding the drainage of the Nicholls Hospital, the directors are making arrangements by which there will be no contamination of the river with dangerous matter.

Well Water.—I have analyzed about seventy samples of well water, and, as in previous years, have found a large portion very impure. I would again point to filtration as the only remedy for this. In the case of a water works supply cheap filters can be attached to the tap. Children attacked by diphtheria are generally said by their mothers to be great water-drinkers, and typhoid fever seems to occur more frequently among the water-drinking class than among those who resort to more potent beverages.

Infectious Diseases.—Twelve deaths from diphtheria and two from typhoid fever have occurred throughout the year. No scarlet fever has been reported, but an epidemic of that disease is evidently not far off, in which case an important question not yet brought before the Board will have to be considered. I refer to the exclusion of Mechanics' Institute books from families attacked with that disease. It is powerfully infectious and every precaution must be taken to prevent its spread. What more natural than to amuse a child recovering from scarlet fever with illustrated books, and what more likely than that the next family into whose hands the book falls will, if liable, take the disease without dreaming where it comes from.

Placarding of houses has been carefully attended to. Most families are anxious to have the cards removed at the earliest possible moment. This cannot be done until the house, clothing, bedding, etc., have been thoroughly disinfected.

Milk Supply.—There have been no complaints, and hence it was not deemed necessary to put in force the clauses relating to the supply of milk. However, vendors were notified that their places would be subject to inspection.

The bakeries have been, on the whole, well kept, and their water supply is rather better than the average.

Nicholls Hospital.—Following are the statistics of infectious diseases in the Nicholls Hospital during the past year, as kindly furnished by the Lady Superintendent :—

	Cases.	Deaths.
Typhoid fever.....	15	1
Diphtheria	11	1
Scarlet fever	2	..
Measles	1	..

Sanitary Work.—Appended is a synopsis of sanitary work done during the year. The chief and members of the police force have done their best as sanitary inspectors, but this year their more important duties have frequently interrupted the work :—

Yards examined	554
Water-closets examined	420
Yards found in good condition	125
Yards ordered to be cleaned	429
Manure heaps, hog pens, etc., removed	30
Notices served, dirty yards and closets	180
Notices served, garbage and refuse	75
Old wells cleaned	6
Dead animals burned	206
Houses placarded	23

J. CLARKE, M.D.,
Medical Health Officer.

PICTON.

Medical Health Officer's Report.

For the earlier part of the year 1888, I have nothing special to report ; a general good state of health prevailing in the town, with the exception of the advent of infantile disorders, as measles, scarlatina and whooping cough.

As the cold weather advanced, particularly during the month of October, there were many grave attacks of pneumonia, some of which terminated fatally. During the months of October and November there were fourteen cases of typhoid fever and two deaths. At the same time there were many cases of malarial fever, chiefly caused by the low water that obtained in a marsh at the southern limit of the town. The attention of the Council has been directed to this, and a committee appointed to take action relative to the drainage of the same.

In October a case of diphtheria was reported to me. The house was quarantined and every precaution taken to confine the disease to its limits ; two of the inmates were affected, and the disease was confined to the house, all the inmates making a good recovery. It is worthy of remark that this disease was contracted by the father of the family and his son while visiting a house at Trenton, where diphtheria had prevailed some weeks before.

No general system of vaccination has been adopted here for the last four years, since an outbreak of small-pox at that time; consequently, a great number of the children attending the public schools are unprotected against an attack of this disease.

A by-law has been passed granting \$30,000 for the construction of waterworks, but I consider the source from which the water will be taken to be impure and unfit for drinking purposes.

In consequence of the increasing population of the town some wells have been contaminated with sewage matter, and have been prohibited, hence the necessity of having a pure supply of water for sanitary purposes.

HENRY B. EVANS, M.D.,
Health Officer.

PORT ARTHUR.

Medical Health Officer's Report.

I herewith beg to present my health report for 1888. We have enjoyed comparative immunity from disease this year, but this fact should not be placed entirely to the credit of the townspeople in general. Considerable difficulty has been experienced during the year in making certain parties come to time in the way of observing health regulations framed for the public good; some nuisances still exist which should not be tolerated for a week, though they were pointed out by me early in the summer. In this particular it seems to me that the Local Board of Health cannot hold itself blameless, as it has the power, *if it has the will*, to abate all nuisances. In sanitary matters the people of Port Arthur have not this year exhibited their usual strong good sense and discrimination. In proof of this assertion, we are confronted by the fact that we have had twenty cases of diphtheria this year, as compared with one last year. In at least 75 per cent. of these cases the nuisance which caused the disease was distinctly located, and after abatement of the nuisance the disease was choked off in that particular locality. It only once or twice occurred that a second case broke out in the same habitation, and all parts of the town seem to have been invaded at some date during the summer. It is true that we had only two deaths in twenty cases; but, in view of the foregoing fact, we are much more indebted to the kindness and indulgence of Providence than to our own good sense and forethought. If due attention to cleanliness had been observed, we would probably have had only four or five cases of diphtheria instead of twenty. Last year every one seemed cheerfully to follow the direction of the Board, and we had only one solitary slight case. Last spring we were, as a town, somewhat dirty and negligent, and, as a consequence, we had twenty cases of diphtheria! While this was very largely true of private yards and back premises, it is only due to the Town Committee of Works to say, that when the true state of affairs was represented to them in a letter from me to Chairman Smith, vigorous attempts were at once made to put the streets and ditches in proper order. I am told that about twelve miles of ditches were cleaned out, and many nuisances on the public highway abated. We have had also several cases of scarlatina, four of whooping cough and one of measles; but, with the exception of one case reported from the hospital, we have had no instances of fever. In the adjoining municipality of Oliver there was for a short time an epidemic of measles, which we escaped.

There has been no extension of our sewerage system since last report, when construction was going on; but of the benefits of what we have obtained in the way of efficient drainage we have had ample proof during the past summer.

Negotiations have been steadily carried on during the past year with regard to the construction of water-works for the town. The labors of those concerned in these negotiations have been crowned with success; a contract has been signed and all preliminary work will be begun this winter. The question of vaccination of the pupils in attendance upon the High and Public Schools overlooked last year, has been thoroughly attended to since the midsummer vacation; but no action was taken as regards the Separate School

as the trustees omitted to notify the Medical Health Officer of their wish to have this matter attended to. Only one complaint has been lodged during 1888 of the adulteration of milk, and on examination it was plain to the eye that the sample in question had been grossly adulterated. General reference was made of the case at the time in the local daily paper, since which time there has been no complaint. I believe that the milk supply is in general pure and good; but, in the absence of the proper instruments wherewith to test the quality of the milk sold to us, no analysis has been made.

On the basis of the assessor's returns as to the population of Port Arthur, the death-rate for the twelve months ending 15th November, 1888, is exactly nine to the thousand. Last year it was twelve and a quarter. Probably no town of similar size in Canada can produce a more favorable report under this heading. This includes all deaths from whatever cause, in our hospital; and, also, several cases in which people came to town from outlying points to secure proper nursing and necessary comforts, nowhere to be obtained between Rat Portage and North Bay except at Port Arthur, and in which the patients lived only a few days after their arrival here. Such cases amounted to fully 30 per cent. of the total number of deaths; and as those who die in the hospital are nearly all waifs and wanderers from all parts of Algoma, and never saw Port Arthur till the prospect of death was before them, the death-rate of the *bona fide* citizens of our town, who are included in the census, would not amount to much more than six to the thousand of the population. A cursory examination of the birth returns for the past year will show that they are somewhat incomplete. Hoping that any matter complained of in this report will receive attention, and will merit favorable notice in the next annual health report.

THOS. S. T. SMELLIE, M.D.,
Medical Health Officer.

PRESCOTT.

Secretary's Report.

The Local Board of Health appointed a Medical Health Officer and a Sanitary Inspector, whose duties commenced in the month of May.

At intervals during the season the Sanitary Inspector reported to the Local Board the sanitary condition of the town, which he found in a very satisfactory condition. He made several house-to-house visits, and the inhabitants of the town have at all times shown a cordial disposition to comply with the requirements of the Public Health Act and the suggestions of the Sanitary Inspector. As a consequence, we have been comparatively free from contagious or infectious diseases, with the exception of three or four cases of diphtheria, one of which proved fatal. These cases were scattered, and were not traceable to any cause requiring special attention from the Board of Health. It is gratifying to notice that the Medical Health Officer's services were not required during the year.

B. WHITE,
Secretary.

PRESTON.

Secretary's Report.

Last spring, as has been the custom in this corporation for twenty years or more, notices were posted up through the village ordering the annual and general cleaning up of all premises. The particular instructions contained in the notices were complied with to the satisfaction of the Inspector when he made his rounds.

During the year there has not been much to complain of as to the sanitary condition of our village, except, perhaps, a few malodorous pig-sties, and these the Inspector visited whenever he could feel the smell outside the statutory limit.

It is also a matter for congratulation that by-laws were passed and came into force on the first day of May last, prohibiting cattle from running at large, and compelling the owners of dogs to have them tagged and registered in the clerk's office.

The effect of these by-laws has been to greatly reduce the number of cows, and to a lesser extent, unfortunately, the dogs kept within the corporation, and to stimulate a comparatively new industry here, viz., that of milk peddling.

In connection with the milk business I might say that the trade is not yet under as proper a system of inspection and regulation as it ought to be, but trust that there will be nothing to complain of in this respect long before my next report.

I think that if it were suggested to the School Board that no pupil be admitted to the school without furnishing proof of successful vaccination, they would add one more to their nearly perfect rules and regulations.

I am sorry to state that the mortality for the year has been greater than usual, but I am pleased to add that the deaths were not caused by preventable diseases.

WILLIAM A. HUSBAND,

Secretary.

ST. MARY'S.

Medical Health Officer's Report.

In compliance with the requirements of the Health Act, I beg leave to present to you my report for the year 1888.

I am happy to be able to state that so far as reported to the Secretary, we have had no cases of contagious diseases whatever save one of diphtheria and one of typhoid fever. These were of a mild nature and made perfect recoveries, so that whatever unsanitary conditions may have been in the town this year, they have not been instrumental in doing any harm.

The Health Inspector, as usual, made a careful inspection of the town last spring, and succeeded in doing a great deal of good by directing the attention of our citizens to their duties in regard to cleaning up their premises and putting them in a good healthy condition, but although one visit might be enough for some persons to enable them to discharge their duties aright, there are others who would require several before they considered they had any right to make any move whatever. I think it would be well, therefore, if the Board would allow the Inspector to make several visits during the season, and see that the requirements of the Health Act are rigidly carried out in regard to cleaning out yards, privies, wells, etc. No excuse whatever can be offered by persons neglecting to do their duty in this important particular, because the council this year secured a location (by lease) for the depositing of all kinds of filth, and I have no doubt would do the same next year if asked by the Board of Health.

There were some matters to which I referred last year in my report, especially the sewer, that must still be occupying the attention of the Board, if they have not been dismissed from their minds altogether, for no attention whatever has been paid to them so far.

Milk is a diet specially adapted to children, and at a time of life when they are unable to resist the injurious effects of impure food. It is therefore of the utmost consequence that that only should be sold which has the different elements of its composition in normal proportions. An inspection therefore ought to be made of the cows giving milk, to see that they are all healthy, that they get a good supply of pure water, that they are properly housed and cared for, that the ventilation of the stables in which they are

kept is what it ought to be, that they are kept clean, that no impurities of any kind are in or around the buildings that would have a tendency to taint the milk in any way,—in fact, it is impossible to be too particular upon this one article of diet. It is only necessary for any member of the Board to read section 113, sub-sections 10 and 11 of the Health Act, to ascertain his duty on this very important matter.

JOHN SINCLAIR, M.D.,
Medical Health Officer.

SIMCOE.

Secretary's Report.

Your Board of Health beg to submit the following report : No epidemic has visited us during the year. We have returns for seven months, in which time twelve deaths have occurred. On account of the former clerk's absence from town we were unable to ascertain the number of deaths in the preceding five months, but averaging the same the probable number will be twenty-one for the year. Very few complaints of nuisances have been made to the Board, but when made instructions have been immediately given to have the cause removed. A short time ago vaccination was recommended, and a proclamation was issued asking the inhabitants to give the same their prompt attention, which was complied with to quite a large extent.

N. C. FORD,
Secretary Board of Health.

SOUTHAMPTON.

Medical Health Officer's Report.

In presenting my annual report, I have to congratulate the people of the town on account of its freeness from disease. We have had no epidemics of either contagious or infectious diseases ; but, although we have been free from these, the suburb known as Denny Mills, was visited with an epidemic of typho-malarial fever of a severe type. There were no deaths. The precautions taken prevented the disease from spreading.

In all cases the instructions of the Board of Health were willingly complied with.

WILLIAM SUMMER SCOTT, M.D.,
Medical Health Officer.

STRATHROY.

Medical Health Officer's Report.

In accordance with the Health Act, I beg leave to submit my report for the current year on the sanitary condition of the town.

At present we are pleased to be able to state that the general health of the inhabitants of this place is fairly good. There are few, if any, cases of fever remaining just now. Diphtheria, which at one season of the year threatened to give us a great deal of trouble and annoyance, has, so far as I am aware, ceased to exist. The number of cases was nineteen and the deaths eleven. The type of the disease which visited us at that time was of a very malignant nature, but by a judicious use of disinfectants, the isolation of the families as much as possible, and the carrying out of strict sanitary arrangements, we were enabled to confine the disease to the immediate neighbourhood of the outbreak.

It is difficult to account for the cause ; it might be partly due to a want of proper drainage, as the locality in which the epidemic prevailed was low and the drainage very imperfect. In the early summer months we had not a very plentiful supply of rain, and followed by great heat, so that when the fall rains came on we had quite a number of typho-malarial fever, nearly all of which, however, were readily controlled by proper treatment. There was only one death, so far as I know, due to fever, and in that case the disease was contracted in a neighbouring town where a more serious form of the fever prevailed.

During the months of April and May a thorough cleaning of closets took place. The alleys and bye-ways were cleared of everything noxious and disposed of by the contractor of that work to the satisfaction of the Board and all concerned, as there were no complaints this year that I have heard of. As has been suggested in previous years, it would be well for the town to purchase a lot, so situated that it would not be in any way injurious and offensive to anyone, where all such refuse could be consumed or put to practical purposes for enriching the soil, etc. Some complaints have been made of parties depositing garbage and rubbish of all kinds on the sides of some of the leading roads adjacent to the town, thereby creating a nuisance. It would be well that in future the sanitary inspector be consulted before such material be left in that way, as to whether it be suitable for road purposes or not. There have, as in previous years, been complaints made as to matter thrown into the river by the woollen factory and tannery in the east end, which we hope may in some way be remedied the incoming year.

Before closing this report I might venture to call the attention of the Council to the advisability of securing a building that could be used as a hospital for a time when we are visited by epidemics of malignant diseases, so that isolation could be properly carried out by having those first attacked removed to where they could be properly looked after by a competent nurse or the mother of the family. The head of the family could then follow his usual occupation, and his residence need not be placarded ; and very much of this outlay would be required for the support of the family, and the prospects of recovery very much increased.

Your Board of Health have, as in the past, done all they possibly could do with the means at their disposal for the relief of those in want or distress ; and we hope ere long that sanitary science may be so thoroughly understood and practiced in this place that life may be prolonged and existence rendered less painful, disease diminished, rendered harmless or stamped out altogether.

G. HENDERSON, M.D.,
Medical Health Officer.

TRENTON.

Medical Health Officer's Report.

During the year we have had no serious epidemic, and have escaped well from the ravages of malarial and typhoid fevers, which, owing to the long continued drought, were so prevalent in localities similarly situated. I trust that to our efforts to enforce sanitary regulations some part of the good result is due. Diphtheria of a malignant and fatal type has prevailed in neighbourhoods not far distant, while we have escaped with comparatively few attacks and scarcely any mortality, only one case proving fatal ; but the mere fact that we are never very long rid of this pestilence shows that something is wrong with our sanitary condition, which should incite us to greater watchfulness and activity for preventive measures.

The manner in which reports of contagious diseases are forwarded to the Health Office is still faulty, though an improvement on former years. The Board, having now printed blank reports supplied to all the medical men, may reasonably expect still better results in this direction.

Our water supply is a matter of grave concern. The supply to the lower portion of the town, derived from springs on the first terrace hitherto quite pure, will soon be contaminated by sewage, as houses with common privy-pits are now built on two sides of it, and the porous soil on the elevated portion supplied by wells, renders them dangerous. I fear, however, that but little attention will be paid to this most important matter, since so much money has been and has yet to be expended on the improvement of our water-power ; still it cannot be too early considered what are the best systems of both water-works and sewerage adapted to our needs and investigated by the Council and Board of Health.

With respect to our supply of milk, meat and other foods, I have instructed the Inspector to use the utmost vigilance in regard to its purity, which his enclosed report shows he has done.

At the time of licensing the milk vendors a thorough inspection of the cattle and premises, as well as an enquiry as to the food and care they received, was made by Mr. Preston, Veterinary Surgeon, and a favorable report presented. The butcher's shops were also examined and registered.

During the summer I reported to you the necessity for the purchase or lease of an hospital for contagious diseases in an isolated locality, as the experiment of Baker Island proved too expensive to be repeated, besides being inaccessible to ordinary conveyances.

More attention should be paid to scavenging the streets and squares, as well as the lanes in rear of stores and shops. It would pay the street committee to keep a horse and cart for this purpose, which could be used also by the Board of Health for the removal of the contents of earth closets, etc., which at present is a thing of some difficulty.

CHARLES McLELLAN, M.D.,

Medical Health Officer.

WHITBY.

Medical Health Officer's Report.

I have the honour to submit the annual report upon the sanitary condition of the Town of Whitby.

Owing to the sanitary measures adopted in the fall of 1887, we have had a comparatively healthy year. During the dry-hot weather we had a few cases of typhoid fever of a mild type, none proving fatal.

In consequence of the unusually damp and humid weather prevailing this fall a few cases of sore throat and diphtheria were reported, when I endeavoured as far as possible to bring the Public Health Act into operation. The tile drain mentioned in my last report has been completed by the town council, and has proved effectual in removing the nuisance complained of by Principal Hare and others. The Inspector has continued to make the necessary inspections, and in required cases has caused privy-vaults to be closed up and dry-earth closets substituted.

Before the frost set in the closets attached to the Public Schools were thoroughly renovated and every precaution taken against disease. Finally I may state, as helping to prove our good sanitary condition, that the chairman of the Board of Health has not deemed it necessary to call a meeting of the Board for some months.

D. P. BOGART, M.D.,

Medical Health Officer.

WINDSOR.

Medical Health Officer's Report.

Another year of comparative freedom from contagious disease is a matter calling for profound thankfulness on the part of the people of Windsor. The number of cases reported and the number of deaths are by far the lowest since the establishment of the Board of Health. The record is as follows:—Scarlet fever, 26 cases, 4 deaths; diphtheria, 50 cases, 6 deaths.

The mortality from all causes from November 15, 1887, to November 15, 1888, was 134, being at the rate of 15.58 per 1,000, placing the population at 8,600.

On the appearance of small-pox in Buffalo, Toronto and other places in this Province, your Board appointed three public vaccinators and supplied them with vaccine from Dr. Stewart's establishment at Palmerston, but I am sorry to say that very few avail themselves of the services offered. Typhoid fever is hardly known here.

The water supply, which has received some notice this year, calls for further investigation. Samples for analysis were sent to Ottawa, and the Government Analyst gave a very favorable report, rating the water as the fourth purest of the samples sent to him for examination. Chemically the water is all right, but its biological character is not yet determined.

The large addition of 8,331 feet of water mains laid this year will be a great sanitary improvement, as it will bring the water within the reach of many who could not hitherto avail themselves of it, and it will form circuits where blind ends previously existed. It was a happy thought to put in a flushing connection from the new water main to all the sewers at the Wyandotte street crossing. It will go far to purify the sewers during the summer months.

While 2,932 feet of brick sewers, of an average diameter of 20 inches, have been constructed, I think it is a matter for regret that sewers were not put into McDougall street and Dougall avenue, both of which streets are thickly inhabited, and the people are compelled to maintain cesspools in their own yards or in the gutters in front of their houses. I hope that next year's council will deal with this matter. The council deserves the thanks of the Board of Health for the excellent work done in filling up the depression in the Pitt street sewer. It was a regular magazine of filth, but is now a comparatively clear stream. I understand that there is a deficiency in the law enabling the council to compel parties living on sewered streets to connect their premises with the sewer. I will ask the Provincial Board of Health to have this rectified, as it is a great farce to have a sewer constructed and then not used.

A recent report which I made to the Board of Education shews that in four schools visited there were 880 pupils on the rolls and only 782 seats. The minimum air space laid down by the regulations of the Education Department is 250 cubic feet of air space to each pupil. The average space in the schools mentioned is only 174 feet, and some of the rooms are as low as 94. This combines compulsory education with compulsory suffocation.

Milk inspection will be inaugurated next year, and in order to make it effective an increase in the annual appropriation will be necessary.

The butchers continue to slaughter on their premises and to empty the offal into the sewers. The entrails of animals in all shapes of decomposition, were some of the deposits in the depressed parts of the Pitt street sewer, and unless the police are held accountable in this matter the Board of Health cannot abate it. The work is done at night and the police alone can prevent it.

The late addition to the town of 262 acres, with a population of 600, will increase the work of the Board of Health, but it will also have a salutary effect in enabling it to place under systematic regulations a population which has hitherto taken very little pains to control contagious disease.

JOHN COVENTRY,
Medical Health Officer.

WINGHAM.

Secretary's Report.

Our town during the year has been entirely free from all infectious and contagious diseases. This is more than we expected at the beginning of the summer season, on account of the great nuisance which exists on one side of our town. This consists of a very large accumulation of dead and rotting timber and other rubbish, in what is known as Hutton and Carr's Mill Pond, on the River Maitland, between the Town of Wingham and the Township of Turnberry, and which has been collecting here for the last twenty-five years or more. It has now reached extraordinary dimensions, covering some 15 or 16 acres.

Owing to the obstruction of the natural flow, the water on the greater part of the pond has become stagnant and contains a large amount of rotten timber and other debris. In spring time dead horses and cows come floating down the stream at the "break-up," and contribute their carcasses to the general nuisance. During the hot season this pond emits a most disagreeable smell, polluting the atmosphere around it and increasing the danger to health.

We have endeavoured to get the County Council to remove this nuisance, under authority of the amended Municipal Act, 1888, relating to driftwood and fallen timber in streams forming the boundaries between municipalities, but so far we have been unsuccessful. The owners of the property on which the nuisance exists refuse to clear it away. The property at the present time is not worth anything. The removal would cost about \$4,000. So far as we can see the Board has no means or power to undertake a work of such magnitude as the cleaning up of this pond, and it is likely to remain as it is until something serious is the result.

This is the only nuisance we have, otherwise the sanitary condition of the town is good, and has been well attended to by our Sanitary Inspector. We have no Medical Health Officer. If the members of the Board, other than the Mayor and Clerk, were appointed for three years instead of one, as at present, I think it would be a great improvement.* I don't know how it is with other municipalities, but outside of the Mayor and Clerk we have three new members appointed every year.

J. B. FERGUSON,
Secretary.

WOODSTOCK.

Medical Health Officer's Report.

I have the honour to lay before you my annual report for the year 1888.

I am glad to inform you that the by-law relative to the dry earth system, which came into operation last May, has been very generally complied with. No less than 150 vaults have been cleaned out and filled up during the year, and the earth closets used instead; upwards of 400 are now in use, so that the old-fashioned vault is almost a thing of the past. However, it will take some time before the people fully understand and appreciate the value of the system.

Your Board have held monthly meetings when thought necessary, and a great amount of good sanitary work has been done during the year, especially by your efficient Inspector.

Early in the year he made a house-to-house inspection, educating the citizens as to the propriety of keeping their premises clean, and the importance of cleaning out the wells. I am pleased to inform you that about 350 wells have been cleaned out during the year, thereby lessening the mortality very materially.

*Under existing laws the appointments must be made every year, as soon as possible after the organization of the council in all municipalities.—[ED. REPORTS.]

I cannot congratulate you on the extreme healthfulness of the town, especially during the months of September, October and the early part of November, as several cases of typhoid and malarial fevers existed, as well as a few cases of diphtheria. Every effort was made by your officers and Board, assisted by the medical men, to prevent the spread of these diseases especially the latter. However, the mortality has been low when compared with places of like size.

I have reason to believe that the above diseases were due to bad water, sewer gases, and marshy effluvia. I trust that your honourable body will, as soon as possible, develop a scheme for the introduction of domestic water, as very many wells are dry during the hot season, and the water in the densely populated parts is almost wholly unfit for use; besides, with a constant supply of water the sewers could be constantly flushed, thereby lessening the danger from sewer gases.

I hope the sewage which has been pouring into Close's ponds for several years will be removed as soon as possible.

These measures being properly adopted and fully carried out, there is no reason why we should not be almost free from very many fatal diseases.

I would also inform you that I have during the year made two inspections of the milk sold, reporting the results of the same to the press.

I am confident that the dairymen and citizens will reap a benefit thereby.

ARCHD. McLAY, M.D.
Medical Health Officer.

VILLAGES.

ACTON.

Chairman's Report.

I have much pleasure in stating that the duties of the Board have been very light indeed. The requirements of the Public Health Act with reference to the sanitary inspection of all premises within the municipality, were duly observed. The Sanitary Inspector performed his duties carefully and to the entire satisfaction of the Board. He found the municipality in a good sanitary condition generally. A few violations of the law were found, but after due notice from the inspector the irregularities were remedied. A matter upon which I feel bound to congratulate the municipality is the fact that, during the three years which have elapsed since the organization of the Local Board of Health, the services of the Medical Health Officer have never been called into requisition through the appearance of dangerous contagious disease, the municipality being entirely free from such misfortune during that period.

H. P. MOORE,
Chairman.

ALVINSTON.

Medical Health Officer's Report.

This village has been remarkably free from disease throughout the whole year. Two cases of typhoid were reported, one of them fatal. Several cases of scarlatina were also reported; there was no death from this cause. Diphtheria was limited to a few cases, all recovered. Isolation and disinfection, though not enforced to the full extent of the law, yet proved sufficient to limit these diseases. Both scarlatina and diphtheria had been endemic here twice in seven years, hence no doubt the little tendency to spreading this year.

When the Board was organized four years ago, a strong effort was made to introduce dry earth closets, in obedience to the recommendations of the Provincial Board. Much opposition was encountered. The change was opposed in quarters where the Board reckoned on moral support. The system was pretty generally adopted, notwithstanding this opposition. The inspectors it would seem relaxed their vigilance after the first year, for the inspector for the present year informs me that not many over a third have continued the dry earth plan. This is a little strange, since the cleaning of privies every spring is compulsory, rigidly enforced and somewhat expensive. The dry earth plan is clearly much cheaper, and therefore should be acceptable to the very class who most generally object to it, the poor. Most families of this class residing in a small place have a garden plot, and therefore should have no difficulty in disposing of the contents of the boxes. One serious difficulty, however, in the working of the system, which I never saw noticed, is this: What is the chambermaid to do with the bucket she carries outside in the winter season, or for that matter in any season. She cannot pour it into the dry earth box, for it would be full in a day or two, and the contents would become one mass of ice, and could not be emptied before spring. Nor can she be allowed to throw the contents in any other convenient place. Now what is she to do? The question is difficult to answer. Those who keep a horse or cow have a manure pile, and it is their custom to empty the chamber bucket there, soon to be carried off to the fields. But all are not so fortunate. Indeed but few can get over the difficulty in that way. Even in summer the difficulty is not easy to overcome. It is at this point that the system breaks down. It is clear that two receptacles are needed. How can a second one be provided? To construct a kind of filter box over a pit, at a safe distance from the well, would not meet the case. That would simply be an attenuated privy.

The sanitarian meets no question more difficult than that relating to the water-closet. Could wells be dispensed with, the task would be made a good deal easier, but that is out of the question in small places. In this village the water is found near the surface. The wells are dug through loose earth and sand to a depth of eight or ten feet. Unless the well be water-lined surface water finds its way into it. That is certain. I would not like to trust even to water-lining. Breaks will gradually occur. Clearly then our well water is more or less impure. This impurity is in the ratio of the amount of filth permitted to enter the soil. Water-tight wells, wells only receiving the water from the bottom, are fairly safe on account of the distance the surface water must traverse before getting into the well; but I doubt if one such well can be found in the whole village. Owing to the nature of the ground on which our village is built, it is apparent that more than ordinary watchfulness is necessary. Unless cleanliness is observed and steadily maintained, our wells will become more and more contaminated, and in due time we shall witness endemics of typhoid fever and other diseases decimating our population. I congratulate the board on its good work so far, and offer these notes of warning only as a stimulus to continued vigilance and unwearied action. What has been done this year must be repeated next year, and even more. "Eternal vigilance" is said to be the price of liberty; it is no less the price of health and longevity.

A. MacKINNON, M.D.,
Health Officer.

ANCASTER.

Medical Health Officer's Report.

The Sanitary Inspector and myself made a thorough inspection of all slaughter-houses, dairies and cheese factories in the township, and saw that they were kept in a cleanly condition during the summer. We also visited all houses and water-closets in the village and directed the owners to clean up, and use disinfectants; and through those means of prevention our municipality has been free from any epidemic. The public schools were also carefully inspected.

HENRY RICHARDSON, M.D.,
Medical Health Officer.

 BELLE RIVER.

Medical Health Officer's Report.

In presenting my annual report, I congratulate the people of our small village on their immunity from any epidemic of either contagious or infectious diseases during the year.

I am not aware of any person having been vaccinated within the village during the year.

The system of drainage which is being carried out is doing much towards removing malaria from our midst; few malarial cases have shown themselves this season, and of a mild form, while formerly they were very prevalent.

All we want now is the drainage of the two ponds existing in the Grand Trunk Railway yard, and also along the track, principally east of the river.

I hope that it will soon be done by the railway company.

ULRIC GABOURY, M.D.,
Medical Health Officer.

 BRUSSELS.

Medical Health Officer's Report.

During the year the Health Board has been active in looking after the sanitary condition of this district.

The usual complaints of offensive premises, neglected privies and defective drains, were fewer than in previous years; while pollution of the river adjacent to this municipality, testing and microscopically examining the purity of the drinking water from some wells, were new features of the work allotted to your Medical Officer. In all cases the remedies as far as practicable were applied to abate the nuisance.

More than the usual variety of contagious and infectious diseases has existed in Brussels this year, the mortality being small. Typhoid fever cases have been also more numerous this past autumn. The origin of the increase is probably due to the unusual dryness of the summer months, the diminished rainfall causing many wells to become dry, and a scarcity of wholesome drinking water, especially in the southern part of the village.

I would cordially thank the members of the Health Board for their cheerful readiness to attend to all the requests and suggestions made by me.

F. G. HOLMES, M.D.,
Medical Health Officer.

 CARDINAL.

Medical Health Officer's Report.

I have the honour to report that the health of the municipality has been exceptionally favourable this year. We have been visited by no serious contagious disease.

The usual steps were taken in the early part of the year to place the premises of the residents of the village in a proper sanitary condition. Drainage was duly inquired into, and made efficient.

A few trivial complaints were made, which were promptly attended to by the Sanitary Inspector.

Your Board are to be congratulated on the favourable results of their efforts this season, and may feel encouraged to proceed in their work for the future with the same diligence that has guided them in the past year.

DUNCAN GOW, M.D.
Medical Health Officer.

CHESLEY.

Medical Health Officer's Report.

I am pleased to be able to report the general health of the municipality good, and that the year has been exceptionally free from contagious or infectious diseases. There have been a few isolated cases of zymotic diseases, but not epidemic. The great fire which almost entirely destroyed the business part of the village, while it caused very heavy financial loss to those interested, has doubtless resulted in very great sanitary benefit; and we have to-day the basis from which the most perfect system of sanitary protection can be formed of any place in western Ontario. I would suggest that the Board take advantage of the opportunity, and organize a plan which shall prevent the careless and filthy habits into which some are prone to lapse, and which are so offensive to good taste, and so injurious to the public health.

HECTOR A. BONNAR, M.D.,
Medical Health Officer.

CHIPPAWA.

Secretary's Report.

In accordance with the requirement of the Public Health Act, I have the honour to forward a report of the sanitary condition of the village of Chippawa.

We have had a few cases of diphtheria, one of which proved fatal. We have had several cases of measles and whooping cough of a mild nature; also a few cases of malaria, which were successfully treated by our Medical Health Officer.

On account of the small-pox being prevalent in the city of Buffalo, only 22 miles distant from this village, the Board of Health thought it necessary to have a general vaccination, which was successfully carried out by our Medical Health Officer. One hundred and seventy-four persons were vaccinated, the municipal council defraying all expenses.

WM. GREENWOOD,
Secretary.

DRESDEN.

Chairman's Report.

The Local Board of Health held its first meeting April 20th, 1888. The Board caused a thorough inspection of the sanitary condition of the town to be made, and every sanitary defect has been promptly remedied by the parties whose duty it was to attend to the same. The Board is pleased to be able to report that no deaths have occurred from contagious diseases, and that altogether only four cases have been reported to the secretary. Notwithstanding the dry, hot weather and scarcity of water in some localities, the health prevailing is remarkably good.

R. P. WRIGHT,
Chairman.

DUNDALK.

Medical Health Officer's Report.

It affords me pleasure to be able to report favourably of the sanitary condition of our village. During the last year we have been exceptionally free from what is known as preventable diseases. This has, no doubt, been due in large measure, to the precautionary measures taken by your Board in the house-to-house visits made with the object of

having wells cleaned out, back yards, water closets, etc., properly attended to. With but few exceptions the citizens have been praiseworthy in their compliance with the law in these matters. The reprehensible practice adopted by a few of having their privies connected with the drain running through the village, I am glad to know you very promptly checked. There is one avenue in which you might righteously expend some of your latent energy. I refer to a nuisance, now of long standing, viz., the *tannery*. Situated as it is on our leading street—where it never should have been—one would expect that special efforts would be put forth by its owners to have it free from those offensive odours which now almost stifle one as he passes. The injurious effect it must have on the health of those in its immediate neighbourhood—to say nothing of the unpleasantness—may be readily imagined. I deem it my duty, therefore, to advise the Board to take such steps as it may see proper to have said nuisance attended to, in so far as it is possible and expedient.

With regard to our more common disease, diphtheria, at one time the bane of the youth of this locality, has been almost extinguished, such cases as we have had being of a very mild type. No cases of scarlet fever have been reported. Diarrhœa among children during the last summer has been mild, and, so far as I am aware, without a fatal case. Typhoid fever, with one exception, has been unknown. In this case, which, unfortunately, had a fatal termination, there is good reason to believe the disease was contracted in a neighbouring village. Whooping cough has sprung up within the last few months, and at present is somewhat prevalent. There has been one death from this disease—a complication of pneumonia being the chief factor in the issue. In conclusion, considering the exalted situation of Dundalk—said to be the highest point in the Province—and its inhabitants enjoying the fresh and invigorating breezes from our northern lakes, we have reason to expect, with fair efforts on the part of our health officers and the assistance of our municipal council, the citizens generally to experience in the future the same immunity from disease we have had during the last year.

JAS. McWILLIAM, M.D.

Medical Health Officer.

EMBRO.

Medical Health Officer's Report.

In compliance with the statute in that behalf, I beg to submit my annual report for the current year.

I have to congratulate the Board on the happy immunity of our municipality from any contagious disease or nuisance which would necessitate the interference of your authority. This is in pleasing contrast to some less favoured localities. There has not been reported, and it is believed there has not occurred, a single case of those contagious diseases dangerous to life.

All slaughter-houses have been removed beyond the limits of the corporation, and the only one now existing is kept in an excellent state of cleanliness.

The dry-earth treatment of night-soil, prescribed by your honourable body, has been very generally adopted, and to this cause I in great measure ascribe our phenomenal exemption from epidemics of a virulent disease. In this connection I would compliment the wisdom of our municipal councils, present and past, in refraining from underlying our streets with those sinks of disease, breeding-filth-sewers, to which so many of our towns and cities owe so much of unenviable notoriety for disease and death. Sewers are but the receptacles and vehicles for the dissemination of the germs of the most dreaded epidemics of disease.

Our milk supply has been so satisfactory that there has been no occasion for the inspection of it or the issuing of licences to its vendors.

The only visitation of any kind of epidemic disease we had during the year, was that of malarial or intermittent fever, of a rather mild type, and quite amenable to anti-periodic treatment, the first cause of which seems to have been due to direct importation from abroad. This was its first appearance for the past fifteen years, so far as I can learn. In the absence of more serious matters for our consideration, I might direct your attention to its mode of propagation. There is no doubt but, like other epidemics, it has its origin in a microscopic parasite, whose germs, floating in water or vapor find a favourable hatching-nest in putrid deposits of any kind, and then multiply with inconceivable rapidity, and attack the bodies of those who swallow them. In places of high temperature and uncleanly surroundings, the disease becomes extremely fatal under the name of congestive chills. That it did not become more severe or widely diffused here, speaks much for the purity of our water supply, and the general cleanliness of premises.

J. ROSS, M.D.,
Medical Health Officer.

FERGUS.

Medical Health Officer's Report.

In submitting my annual report as medical health officer of the Village of Fergus, I am pleased to be able to say that we have been comparatively free from all contagious or infectious diseases. We have had scattered cases of diptheria, two of which proved fatal, but there was nothing approaching the nature of an epidemic, the cases occurring at different times and places. Of the typhoid fever cases, there were also two fatal. The milk supply was blamed for a time, but other circumstances made it most unlikely that this was the cause. In fact there was no traceable cause in this way; we are probably correct in attributing the origin of the outbreak to the small amount of water in the Grand River at the time, and the consequently large amount of decaying organic matter left exposed in its bed, an occurrence which the Board could not in good judgment attempt to remedy. Only very few complaints of nuisances have been made; these in every instance have been attended to without delay. Small nuisances may have existed for some time, and if so parties knowing of them are to blame for not reporting them at once, as it can hardly be expected that the Board can know of all such of itself; and were complaints made early the work of the Board could be made much more effective.

I would again call the attention of the Board and Council to the necessity of having dry-earth closets, with regular removal of all refuse and the closing of all cesspools, etc., throughout the village, as it is impossible to have pure water from wells in close proximity to the forbidden holes and closets now too frequently existing. In order that this might not be a tax on the community, I would suggest that the refuse be given to any person willing to take charge of its removal on account of its land value. Arrangements for this should be completed during the winter, so that cleaning out could be enforced early in the coming spring.

W. H. JOHNSON, M.D.
Medical Health Officer.

GLENCOE.

Secretary's Report.

In conformity with the provisions of the "Public Health Act," I beg to report as follows: The sanitary condition of our village, and the health of its inhabitants have been better during this year than in former years.

Our people with a few exceptions are alive to the importance and necessity of cleanliness; and in the early part of the spring make a through "cleaning up" of their back yards. An occasional reminder from our Sanitary Inspector has proved sufficient to keep the sanitary condition of our village fairly good. Although in the adjoining townships there have been several cases of diphtheria and typhoid fever, our village has escaped both.

GEO. M. HARRISON,
Secretary.

MILVERTON.

Secretary's Report.

Early in the spring the Board caused the Sanitary Inspector to call upon the villagers and notify them to clean up their premises. This with very few exceptions was cheerfully complied with.

Several complaints were made with regard to a slaughter-house and hog-pen in connection with a cheese factory, both of which are situated within the limits of the village, but no action has been taken in the matter further than passing resolutions at the sittings of the Board, and the nuisances still exist. The stench arising therefrom during the warm weather is enough to cause a plague.

The Medical Health Officer has not attended a meeting of the Board during the year, nor has he made any returns of the existence of contagious diseases.

There have been several deaths from diphtheria or diphtheritic croup, measles has been in almost every family during the months of September, October and November, and there have been a few cases of typhoid fever.

The mortality during the year has been higher than any since incorporation, in 1881.

W. D. WEIR,
Secretary.

NEWCASTLE.

Chairman's Report.

The Chairman inspected the southern division of the village and found it in a very good and sanitary condition, with the exception of one well, which the owner agreed to clean out. He also ordered the fishermen to bury all entrails taken from fish in the summer months, and also to bury all fish washed up on the beach.

The officers of the centre division states that their division respecting the premises was found very good and clean, and water very good, with the exception of one water closet and one hog-pen, which were put in a sanitary condition.

The officers of the northern division report that the water on two of the premises was very bad. The proprietors of the premises had the wells cleaned out as instructed by the officers, and all other premises that were in an unsanitary condition were properly attended to.

JOHN TRELEAVEN,
Chairman.

 NIAGARA FALLS, SOUTH.
Medical Health Officer's Report.

I have the honour to report that during the past year our municipality has not been visited by any epidemic; that there have been only a few isolated cases of diphtheria, and two cases of measles now in existence. Since the outbreak of small-pox in Buffalo, the compulsory Vaccination Act was enforced by your Board, and two hundred and twenty-two persons presented themselves and were vaccinated by me at the expense of the municipality. The Sanitary Inspector reports the village free of nuisances.

JAS. MCGARRY, M.D.,
Medical Health Officer.

OIL SPRINGS.

Medical Health Officer's Report.

Our village has been free from infectious disease during the past year. There has been one case of typhoid fever, mild in character, but the utmost vigor was used to prevent its spread, which we happily succeeded in doing. The Board of Health here has done good work during the year, yet the village is in an unsanitary condition, this being the first year that anything at all has been done to prevent disease and its dissemination.

A. R. HANKS, M.D.,
Medial Health Officer.

POINT EDWARD.

Secretary's Report.

Notices to the people to put their respective places in sanitary order were issued in the spring, and copies of the pamphlet for checking the spread of contagious or infectious diseases were delivered to each house in the village. The Board has been active during the year, and have taken every precaution for the health of the village. There were twenty-five cases of scarlet fever of a mild type during the winter and early in the spring, from which one death occurred. In every case the dwellings were quarantined, and on removal of quarantine were thoroughly disinfected and fumigated. During the summer months the health of the village was good. There were a few cases of typhoid fever during the fall of a mild nature. Five cases of diphtheria broke out in the latter part of the fall, from which one death occurred. In those cases every house was quarantined, and on recovery of the patients the houses were disinfected and fumigated. At present writing there is not a case of an infectious disease in the village. The School Board, on receiving their notice in the spring, had the public school thoroughly cleansed and fumigated. This was repeated during the summer vacation. The heating and ventilation of the school is on the Smead-Dowd system.

W. MITCHELL,
Secretary.

PORT ELGIN.

Medical Health Officer's Report.

In submitting my annual report for the year 1888, I have pleasure in stating that very few, if any, cases of disease prevailed due to the association of unsanitary surroundings. The usual orders for cleaning up, issued by your Inspector in the spring, were very generally and cheerfully complied with.

During last winter we were visited by an epidemic of measles, which proved to be exceedingly mild. No cases of typhoid fever of the ordinary severe type occurred, notwithstanding the prevalence of fever throughout the Province during the past autumn. A few nuisances were complained of to me, and in all such cases measures were taken promptly for their abatement or removal.

In conclusion, I congratulate you upon the sanitary perfection of the town.

J. A. McARTHUR, M.D.,
Medical Health Officer.

PORT STANLEY.

Secretary's Report.

In compliance with the Public Health Act, I have the honour to report that the Board of Health held two meetings during the year. Early in May the Inspector made a thorough inspection of the village and ordered all nuisances abated, which, I believe, in most cases was done. The sanitary condition of the village for the past year has been first-class, no deaths occurring from epidemic or contagious diseases, from which the village has been entirely exempt up to November, when two cases of typhoid fever of a mild form occurred; they are now convalescent. Whooping cough also prevails to some extent at present, but it is not of a dangerous character. The Medical Officer informs me that he has no report to make.

JAMES GOUGH,
Secretary.

PORT COLBORNE.

Medical Health Officer's Report.

As Medical Health Officer for this village, I have the honour to report as follows:—This municipality has enjoyed immunity from contagious diseases during the past season, which may be characterized in every aspect as one of unusual good health.

Owing to the existence of small-pox in the city of Buffalo, a proclamation was issued with reference to public vaccination. A willing and most creditable response was given by the public, a majority of whom were successfully vaccinated.

J. B. NEFF, M.D.,
Medical Health Officer.

PORTSMOUTH.

Secretary's Report.

In accordance with the provisions of the Public Health Act, I have the honour to report that early in the year the usual precautionary measures were taken for the cleansing of yards, cellars, outbuildings, privy-vaults, etc., which were fairly well complied with under the supervision of the Sanitary Inspector.

At the request of the Board the Council expended a small sum in cleaning out the main village sewer.

There have been no known diseases of a contagious nature, and it is gratifying to state that the general health of the village has been good during the year, consequently the appointment of a Medical Health Officer was not considered necessary.

THOS. KELLY,
Secretary.

SEAFORTH.

Secretary's Report.

Boards of Health have an uphill work in getting the public generally to realize the necessity of any change in the existing and old established state of sanitary matters. Ignorance of the danger to health arising from the ordinary methods of disposing of offensive and refuse matter, coupled with an unwillingness to go to any trouble or expense in the removal of the same, and a disregard of the comfort or welfare of others, are the chief hindrances to improvements in sanitary matters. I am entirely opposed to the system of carrying away unsanitary matter by means of drains. The drains must empty somewhere, and wherever they do empty there the nuisance crops up again.

Everything calculated to endanger health, and which is capable of being converted into manure, should be deodorized by such substances as sifted ashes, dry earth, etc., and carted away to the worn-out fields which exist everywhere.

It would almost seem that the boasted intelligence and advancement of this nineteenth century is hardly able to cope with the sanitation question; our largest cities seem to be little, if any, in advance of the towns and villages.

WM. ELLIOTT,
Secretary.

SPRINGFIELD.

Secretary's Report.

In presenting you this report of the Springfield Local Board of Health, I may say that we have a Board of Health properly organized, and that on or about the 20th of May we made a thorough inspection of the sanitary condition of this municipality, visiting the slaughter-houses, cellars, shool house, etc., and wherever we found the sanitary surroundings not as they should be, caused the same to be remedied. We have had but one case of scarlatina and one of diphtheria, both of a mild type. Our Medical Health Officer, Thos. McEwen, M.D., has done much in assisting the Board to carry out the provisions of the Act.

J. B. LUOAS,
Secretary.

STREETSVILLE.

Secretary's Report.

I have the honour to transmit to you the following report of the sanitary work done here during the year, and of the sanitary condition of the municipality:—

Seven meetings of the Local Board have been held during the year.

A general house-to-house inspection of the village was made by the Sanitary Inspector in the month of May. While most of the dwelling houses and premises (as the Inspector reported) were found in a satisfactory condition, still in a considerable number of instances nuisances were met with dangerous to the public health. The most frequent causes of complaint were neglected privy-pits and damp and foul cellars.

Where such nuisances or unsanitary conditions existed directions were given for their removal forthwith, and a subsequent visit was made to the premises for an assurance that the directions had been complied with.

The drainage on Mill street was found defective for want of a proper depth and fall to the ditch, and culverts carrying off the water to its proper outlet. This matter was referred to the council to be remedied.

In September the Board instructed the Inspector to make another inspection throughout the municipality, for the purpose of having all premises therein put in a proper sanitary condition before the approach of the winter season.

The health of the municipality was generally good during the first ten months of the year. There were no cases of infectious diseases during that period, with the exception of two cases of typhoid fever in September, one of which at least was contracted elsewhere, the patient coming home ill with the disease, and the other case was a very mild one. About the first of November there occurred an outbreak of diphtheria in the municipality. There have been eighteen cases and two deaths.

As soon as the outbreak appeared to be extending the public schools were closed, and the steps prescribed by the Public Health Act were taken for isolating persons infected with the disease.

The Sanitary Inspector, too, was sent on a house-to-house visitation throughout the village with instructions to householders to cleanse and disinfect their premises.

There has been only one new case during the last week, and it is believed the progress of the disease has been checked.

In reference to the cemetery question, which has been agitated during the last five years, nothing has been done towards providing a new cemetery in a suitable situation in place of the present overcrowded burial ground within the municipality, and nothing seems likely to be done until the municipal council passes a by-law prohibiting any more interments in the present burial ground.

As to slaughter-houses within the municipality, to which reference has been made in previous reports, the matter is in as unsatisfactory a state as ever. Last April the Sanitary Inspector gave notice in writing to the two proprietors of the premises in which the slaughtering of animals is carried on in this village, requiring them to desist from carrying on the offensive business within the limits of the municipality. The business appears to be still carried on, however.

It is plain that the matter of the overcrowded cemetery and the slaughter-house nuisance, which are two standing dangers to the health of the municipality, will have to be dealt with by the council and the Local Board of Health in a decided and vigorous manner.

WM. J. PINNEY,
Secretary.

THAMESVILLE.

Secretary's Report.

The Local Board of Health for this corporation reports as follows :—

That there has been a regular inspection of all premises, public and private, at various times. The sanitary condition of the village is and has been good during the current year. There has been no infectious or contagious disease in the municipality. There is no Medical Health Officer appointed.

J. DUNCAN,
Sec. L. B. of H.

VIENNA.

Medical Health Officer's Report.

The sanitary condition of this municipality during this summer, as far as it has come under my especial observation, has been good. That no disease, infectious or otherwise, has been prevalent in this village, and that the present state of the health of the community is exceptionally good.

J. H. HOOVER, M.D.
Medical Health Officer.

 WATERDOWN.
Medical Health Officer's Report.

This year, as in the past, we have every reason to feel thankful that we have not been visited with any widespread cause of mortality or sickness. We have had very few complaints of nuisances, and where there were any made the cause has been looked into and speedily remedied.

I am happy to state that the municipal council of the village of Waterdown, so far as I am able to judge, is as anxious and willing to have the sanitary condition of our village kept right as they are to the improvement of streets and sidewalks.

We have had no diphtheria, whooping cough, measles or small-pox. I have had some six or seven cases of scarlet fever come under my notice during the year, all of which were of a mild form. There have been some six or seven cases of typhoid in the village during the year. The cause of the last named disease should at the present time be the subject of your especial attention in this village. It is undoubtedly the result of some disregarded law of health. Among the most prevalent causes I might mention the bad condition and position of privy vaults; the unclean and very badly kept yards, and the great danger that exists from the water and the atmosphere being contaminated by them; decaying vegetable matter, animal matter, manure, pig pens, etc.

I think it but right that the Sanitary Inspector's duties should be to inspect all privy vaults, cellars and back yards at least twice every year in a village such as this; and that he be empowered with authority to see that they are kept clean, and that he be paid well for it.

J. A. MCGREGOR, M.D.
Medical Health Officer.

WESTON.

Secretary's Report.

I have the honour to present herewith the annual report of the Local Board of Health for the village of Weston.

Our Local Board was duly formed early in the year, and a Medical Health Officer and a Sanitary Inspector appointed. The latter officer made regular visits to the slaughterhouses and hotels, and his reports to the Board were highly satisfactory. A largely signed petition praying that the cemeteries within the limits of the village be closed immediately, was presented to the Board. I was requested to present the same to the village council, which I did. That body passed a by-law forthwith prohibiting burials in said cemeteries after the 31st December, 1888. I am pleased to state that the sanitary condition of the village during the year has been excellent, there being only one case of contagious disease reported. Prompt means were taken and the disease stamped out.

R. H. LEIGHTON,
Secretary.

WEST TORONTO JUNCTION.

Chairman's Report.

The Local Board of Health was organized in January last, consisting of five members. The village council also appointed a Sanitary Inspector and a Medical Health Officer.

The Board met six times during the year, principally for the purpose of putting the village in a good sanitary condition, which we are pleased to say has been accomplished

through the efforts of the Sanitary Inspector, he having inspected all yards and lanes in the corporation and reports that they are now in a clean condition. We would recommend the council to re-appoint the present Sanitary Inspector, Mr. E. Ward.

Dr. G. W. Clendenan, Medical Health Officer, reports that, fortunately, during the course of the year the village has been exceptionally healthy. A few cases of typhoid fever and diphtheria have been reported, but no deaths among the number. He considers the village in a satisfactory state at present. We also desire to say, with pleasure, that the municipal council have ably assisted this Board during the year, and sincerely hope they will continue in the same course in the future.

JOHN STEWART,
Chairman.

TOWNSHIPS.

ADELAIDE.

Secretary's Report.

I have much pleasure in reporting that the township of Adelaide has enjoyed, as far as I know, a perfect immunity from any disease of an epidemic nature during the present year. Complaint was made to the Local Board of Health that some premises in the village of Kerwood required attention. They were inspected by the Sanitary Inspector and found in a condition not entirely satisfactory. In consequence of further complaints from the same quarter, the Sanitary Inspector was again called upon to inspect the premises, and the remedies suggested by him having been carried out no further trouble was experienced. The Board has met three times during the year. The sanitary condition of the township is good. Nothing else has come under my notice calling for further remarks.

WM. MILLER,
Secretary.

ALBEMARLE.

Chairman's Report.

I have the honour to present herewith the fifth annual report of the Local Board of Health for the Township of Albemarle, and at the same time I have the gratification of being able to report the entire absence from our township of all infectious or contagious diseases during the past year; in fact it has been by far the most healthful period that has been our good fortune to be blessed with since the first inauguration of a Board of Health for this township, only two deaths as yet having been reported. One of these was from old age, and the other from croup. The services of our Medical Health Officer have scarcely been required, and in consequence the Board has deemed it unnecessary to ask him for a report for the year, thereby saving the expense of the same.

ANDREW WEIR,
Chairman.

ALBION.

Secretary's Report.

I have the honour to inform you that the Local Board of Health for the Township of Albion have had nothing to do during the year now drawing to a close. There has not been any outbreak of infectious or contagious diseases, nor has any notice been received of the existence of such diseases. The sanitary condition of the municipality is excellent.

ROBT. EVANS,
Secretary.

ALDBOROUGH.

Medical Health Officer's Report.

In compliance with the statute respecting "Public Health," I beg to report as follows:—

During the winter months a great deal of sickness prevailed—lung affections largely so, but nothing that could be called epidemic. A mild form of diphtheria appeared in the southern part of the township in the spring, being confined to one family; so far as I was informed two deaths occurred. When these cases were reported to me the houses were placarded, and disinfection, isolation and other precautionary measures adopted which prevented the spread of the disease. About the same time measles appeared in one family and the house was at once placarded, with the result that the disease went no farther.

The summer months were ordinarily healthy. Dysentery prevailed to a limited extent through the centre of the township. This may be attributed to the drinking water, which is chiefly surface water and not of good quality.

Diphtheria again appeared last month in the southern part of the township and was of a very virulent type. It was confined entirely to No. 3 school section. Five deaths occurred therefrom, all being young children from two to five years of age. The disease still manifests a disposition to spread. I would strongly recommend to the Board to have this particular school closed till such time as the disease abates. Owing to the excellent drainage in this township, ague, which used to be so common, is now quite unknown. Malarial diseases are not so prevalent as in former years, and typhoid fever, so far as I know, has not appeared this year. Whooping cough appeared once during the year, but with no fatal results. On the whole there was a great deal of sickness during the year. I have reason to think that diseases of a contagious character have not always been reported, and would recommend that all cases of such be reported to the Medical Health Officer.

J. W. BROCK, M.D.,
Medical Health Officer.

AMELIASBURG.

Medical Health Officer's Report.

In submitting this, my third report, I congratulate your Board on the general good health that has prevailed throughout the township during the year, and the almost complete immunity from epidemic or endemic contagious diseases. We have had, it is true, a few cases of whooping cough, which only affected two or three families. Diphtheria visited one family in the eastern part of the township, which unfortunately resulted in two deaths, but no other cases of zymotic diseases are reported.

There has been no progress made in vaccinating during the year. People are so prone to procrastinate in this matter that only an immediate danger from an epidemic of small-pox, or vigorous action on the part of your Board in enforcing the provisions of the Vaccination Act will result in any material advance in this matter.

There have been no reports of any unsanitary conditions made during the year, nor has there been anything of importance to lay before the Board, thanks to the generally sanitary condition.

A. J. FILE, M.D.,
Medical Health Officer.

ATHOL.

Secretary's Report.

In submitting to you the annual report of the Township of Athol, I have great pleasure in stating that the sanitary condition of the township has been good during the year. There have been two cases of diphtheria within the last year, and in both cases the proper notices were placed at entrance to houses. The disease was not carried out of the house in either case.

We have no Medical Health Officer or Sanitary Inspector.

W. MOORE,
Secretary.

BARTON.

Chairman's Report.

In presenting our annual report we are gratified to state that for the greater portion of the year Barton has been very healthy, but during the last two months several cases of typhoid fever took place just outside of the eastern limits of Hamilton. Two deaths were reported. There have been three cases of scarlet fever, but all seemed to be of a light form. A very few cases of diphtheria have been reported.

The Sanitary Inspector has inspected private houses, slaughter houses and yards connected therewith, piggeries, tallow rendering establishments and oil works, fertilizing works, etc., and he reports that the slaughter-houses in most cases are reasonably clean; but as parts of the township are thickly populated, and as at times the butchers do not clean up properly after killing, thereby causing bad smells, we would recommend that the slaughter-houses and pigs in those places and along public roads where there is much travel, be removed to a distance of seventy yards from such roads, and not nearer than seventy yards to any dwelling house, school house or workshop.

The fertilizing works of Messrs. Rowlin & Co., and the tallow-rendering establishment of Mr. A. A. McKillop have caused considerable complaint from the residents of the neighbourhood. Although in both cases they have steam-tight iron tanks, and the exhaust pipes run into the waters of Coal Oil Inlet, yet the smell sometimes is very bad. Both claim that it is impossible to carry on their business causing less bad smells than there have been. We are of the opinion that if the proprietors of these establishments cannot carry on their business without causing so much annoyance to the neighbourhood, application should be made to the courts to have the business put a stop to.

There have been circulars sent to the residents of the township requesting them to comply with the Vaccination Act.

Night soil has been permitted to be brought into the township during the summer, the parties in most cases covering it with earth. In two or three cases proper care was not taken of it, and the parties receiving it were at once notified to abate the nuisance, which was complied with.

JOHN W. GAGE,
Chairman.

BEDFORD.

Medical Health Officer's Report.

It affords me much pleasure to be able to state that the duties of the Board of Health and Health Officer for the past year have been merely nominal, owing to the sanitary condition and general good health of the people.

There have been no contagious or zymotic diseases, except a few cases of measles and two or three isolated cases of typhoid fever, which occurred during the month of March.

A. W. DWYRE, M.D.,
Medical Health Officer.

BERTIE.

Medical Health Officer's Report.

In submitting my annual report for the present year, I am pleased to be able to state that our people have had a favourable year, and that no contagious disease has gained a foothold, though we have been threatened with small-pox, which has existed on our border for several months, and isolated cases of diphtheria, typhoid fever and measles have occurred during the year; but at the present time I am not aware of a case of either in the municipality.

It is my pleasing duty to report that the Council has been induced to take action toward bringing into force the Act in regard to public vaccination, and that we have now four public vaccinators who are authorized to vaccinate all free of charge, and that all the public schools have been visited by them, and that most of the pupils attending were vaccinated.

Reports will be made later in the year giving the number vaccinated, when I believe it will be seen that the most of our people have complied with the requirements of the Act.

I trust that our efforts to prevent the introduction of small-pox from Buffalo may prove successful, and that we may enjoy another year of immunity from contagious diseases.

N. BREWSTER, M.D.,
Medical Health Officer.

BEVERLEY.

Secretary's Report.

In presenting to you my fifth annual report of the Board of Health for the township of Beverley, I have only to say that the Board was appointed and held its first meeting in June last. The business of the first meeting was simply to organize and prepare for action when necessary. The Board meets to-day to wind up the business of the year. The number of deaths for the year thus far will be about fifty, one of typhoid fever, two of croup and two of whooping cough. About twenty of the total number were over the age of sixty years. I received two notices from Dr. Ross, of Dundas, of cases of diphtheria in a family in the south-east part of the township. I caused the usual notice to be posted up at the house. The patients recovered all right. On the whole I think the health of the township during the year has been fully as good as the average.

W. McDONALD,
Secretary.

BINBROOK.

Medical Health Officer's Report.

In accordance with the requirements of the statute I beg leave to submit my report. I am happy to say that the health of the township of Binbrook during the present year has been very good.

I congratulate the Board on the apparent—I feel assured I may say real—success attending the means taken by you to have the privies and wells in the different school sections of this municipality cleaned and put in a proper condition. I am able to report that there has been no epidemic disease among our school children after that work had been attended to. I am also glad to notice a growing feeling among private individuals of the necessity of having proper sanitary arrangements in and about their premises; and more, I feel confident their health has been sustained and improved by their attention to these important matters. It is to be hoped that many others may be stimulated to make like improvements.

In the erection of buildings in the country great attention should be paid to the following points:—

1. Proper ventilation.
2. Better drainage from cellars and foundations.
3. Privies further removed from wells and dwellings, so that there is no danger of the drinking water, or even that for ordinary purposes, being polluted.
4. Privies so constructed as to be easily cleaned out at proper intervals, and the use of the dry-earth system in the same.

There have been a couple of cases of typhoid fever, but by strict precautions and the free use of disinfectants the spread of the disease has been prevented.

In the early part of the year there were a number of cases of scarlet fever, measles, and two cases of diphtheria, all of a mild type.

In conclusion I would like to say to the Board that they must expect some opposition to the carrying out of their plans; it will take time to educate the people to a sense of their responsibility in these matters of sanitary reform.

I think it would be well to hold public meetings at a convenient time in the year, where the laws or statutes of the Public Health Act could be discussed, and all enlightened in regard to their duty in these matters.

M. J. MULLOCK, M.D.,
Medical Health Officer.

BLANSHARD.

Medical Health Officer's Report.

We have reason to congratulate ourselves that the health of the township has been so good during the past year. Diphtheria broke out in several places in the municipality during the year, and resulted fatally in several cases. Typhoid fever only appeared in two instances, one of the attacked died after a week's illness. Measles spread from house to house and from section to section during the spring months, but the epidemic passed over without being the cause of a single death. In a few cases very severe lung trouble resulted, threatening the lives of the sufferers. This disease is looked upon by the community at large as a very harmless epidemic disease, but facts prove the contrary, and those looking on this disease as such are labouring under a serious delusion.

It would be in the interest of the public if all medical men would comply with the requirements of the Health Act, and notify the local Medical Health Officer of such cases of contagious and infectious diseases as he may be called upon to attend.

The welfare of the community would be very much advanced if all the children attending the public schools who have not a proper vaccine mark, were vaccinated at the

expense of the municipality. Inspection proves that a great improvement has taken place in the condition of the schools and their surroundings, but still there is much room for sanitary reform.

It has been urged by the central authority (and I think with very great reason) that a stricter supervision should be kept on slaughter-houses, with regard to the cleanliness of the places, disposal of the offal, and the slaughtering of diseased cattle; also regarding milk supply to factories, and the sanitary condition of such factories.

Hoping that we may be able to advance the interest of the public health to a greater degree than we have done in the past.

WILLIAM IRVING, M.D.,
Medical Health Officer.

BLENHEIM.

Chairman's Report.

In presenting you with our yearly report we have little to remark that will be of interest. General good health has prevailed over our township.

The members composing our Board are located conveniently in various parts of our large township, and each looks pretty well after his own section. During spring the Board formed committees consisting of two members each, and visited the cheese factory, school houses and slaughter-houses of our township, all of which were found in a very cleanly and satisfactory condition.

There was one case of diphtheria and one of scarlet fever reported from the south, but proper disinfectants and isolation soon stamped out the disease. Since our Secretary wrote you last, we have had a report from the north of the township of some diphtheritic cases, which happened some time ago but were only lately reported. Our reeve was in almost daily attendance on these cases, the best of disinfectants were used, the children were kept properly isolated, and the disease, although proving fatal to five children in this family, did not spread beyond it. The cause of the disease was supposed to be a defective drain. The same report contains reference to another family in which three cases are reported, two of them being fatal. One, a child 18 months old, died of septicæmia, the result of nasal diphtheria, and another one died some weeks after from paralysis. The disease did not spread further.

W. R. PENTLAND, M.D.,
Chairman.

BOSANQUET.

Medical Health Officer's Report.

Acting upon the instructions of your Secretary I inspected the cheese factories and slaughter-houses in the township, and found them clean and in a good sanitary condition. This year the township was visited by an epidemic of influenza, making the death-rate higher than it is usually. Scarlet fever of a severe type broke out in some parts of the township, but did not spread owing to the precautions taken to isolate the cases, and keeping them out of the schools for a long time after they were convalescent. There were a few cases of diphtheria this year. I would call the Board's attention to the fact that small-pox has broken out in Sarnia, and few of the children of the township are vaccinated.

W. A. MUNNS, M.D.,
Medical Health Officer.

BROCK.

Medical Health Officer's Report.

Our report for this year, 1888, will of necessity be brief, as but little in the sanitary line has required the attention of the Board. Our municipality is to be congratulated on its comparative exemption during 1888 from epidemics, there being only about five cases of diphtheria and two deaths; fifteen of typhoid and two of scarlatina reported. A mild type of measles spread over the whole district, but it was so mild that a physician was rarely required, and consequently but few cases were reported.

JAMES McDERMOTT, M.D.,
Medical Health Officer.

BROOKE.

Medical Health Officer's Report.

Typhoid fever and diphtheria are ever on their rounds—a case here, several there, and a severe endemic yonder. This appears to be the condition of things in all the older sections of our country and of other countries as well. During the year there have been a few cases of these diseases in the municipality, but, so far as I am aware, no fatal case of either. There have been also several cases of scarlatina, but no deaths. A strange and prevalent delusion exists in regard to scarlatina. Most people believe in the existence of two distinct diseases, having some points of resemblance; one they call scarlatina, or “scarlet rash,” the other scarlet fever. It should be widely known that medical authorities recognize no such distinction. Scarlet rash, scarlet fever and scarlatina are but different names for the same disease, the last mentioned being the technical or scientific name. The same poison produces all the symptoms and variations observed. When the disease is mild the symptoms are few and simple; when it operates more powerfully, these are more severe and marked. The same may be said of diphtheria. This disease is often so mild as to pass for a very mild “sore throat.” These “walking cases” of both diseases do more to spread infection than the more severe cases, because unsuspected. Even typhoid fever has its mild or “walking cases.” A knowledge of these facts would lead to greater caution on the part of the more prudent, and greatly tend to limit the spread of infectious diseases.

In its short history the Provincial Board has done a great work. The people are being gradually educated to the importance of observing certain laws and regulations. Even an imperfect observance of the law has been often efficacious in limiting and stamping out the infectious diseases. The value of isolation and disinfection is just becoming known and appreciated; so that the time is not far distant when officers of the law will no longer meet with opposition, but on the contrary find their duties easy and pleasant to perform, because of the aid and willingness of a well informed and rational people.

Within the area known as the St. Clair district, malaria, of course, prevails to some extent at all times and places, but in this section it is never of a malignant type. Even in this respect great improvement has taken place during the past few years. This change is chiefly due to the extensive system of drainage undertaken by the municipality at the cost of much trouble and money. The primary object was the reclaiming of several square miles of rich, low-lying lands within the bounds of the municipality, but the great water-courses thus constructed could not fail to exercise a highly beneficial sanitary influence.

Sanitarians tell us that the greatest danger to health and life is found in the water we drink. Of the truth of this there can be no doubt. The greatest danger to health on the farm, therefore, is the *well*. Too much stress cannot be laid on this fact. The carelessness often displayed in the construction of wells is truly amazing. No attempt is

made at excluding surface water, and not infrequently they are found in the barn-yard, or in close proximity thereto. And yet people will be surprised if people sicken and die, or one of the children is suddenly prostrated with diphtheria! Medical men should make the construction of wells and the contamination of water something of a study, with a view of spreading information regarding a matter so directly affecting the health and the lives of the people.

Another, though a lesser source of danger on the farm, is the running stream. No matter how limpid and inviting to the thirsty, it is the sure carrier of disease and death. In the early times when no one lived on the "banks beyond," the water in the "babbling brook" was pure and wholesome; but the aggregation of population has wholly changed the conditions. The banks which were then in virgin purity, are now covered with towns, villages and farm-houses. From these banks now issue into the running stream town sewerage, barn-yard drainage, and every kind of filth. As if this were not sufficient to fill the bill of abominations, the stream is made the common receptacle of the dead carcasses of all manner of beasts! Who can wonder that death is found in the sparkling brook? Not a summer passes but horses and cattle perish along the course of the Sydenham from dysenteric fever, caused by the impurity of the water. Nor are human beings wholly exempt from this danger, especially in seasons of drouth, as the following will show. Several members of a family were almost simultaneously attacked by a mysterious disease, marked by fever, a pustular eruption, (some of the pustules assuming the size of boils) and a marked tendency to pleuro-pneumonia. Two deaths took place, one of them directly due to this cause, and the other at least remotely so; while others of the family were in imminent danger. The surroundings every way appeared excellent, indeed faultless. The well was so placed and constructed that contamination of its water was well nigh impossible. But, unfortunately, it had gone dry. The want thus created was supplied by pouring into it several barrels of clear Sydenham water, there to be cooled and pumped up as needed for all household purposes. What was hitherto enveloped in much mystery now became clear, and needed no further research.

The conclusion to be drawn from these illustrations, as well as from other incontrovertible evidence, is this: the water of streams running through a populated country is impure beyond description, and unfit for the use of either man or beast. This fact should be everywhere known and proclaimed. Let no one be deluded into the belief that cold, winter weather purifies such waters, or that the impurities are lost in the formation of ice. The farmer, no less than the residents of small places, must depend upon wells and cisterns. When these are well guarded against contamination nothing more remains to be done, and nothing more is desired.

ANGUS MACKINNON, M.D.,
Health Officer.

BRUCE.

Medical Health Officer's Report.

In presenting this my annual report, I have pleasure in stating that the sanitary condition of the township has been fairly good during the year, but not as free from contagious and infectious diseases as last year.

Scarlet fever prevailed to a considerable extent, though not proving fatal in any case as far as I know.

Measles of a mild type existed to a limited degree. Diphtheria and typhoid fever made their appearance in different localities without any fatal results.

In conclusion I would call the attention of the Board to the necessity of insisting on physicians attending contagious or infectious diseases within the municipality, notifying the Secretary of the Board of Health of the existence of such diseases.

A. MACKAY, M.D.
Medical Health Officer.

BURFORD.

Medical Health Officer's Report.

I have to report returns of whooping cough one case, recovered; typhoid fever, eight cases, five recovered; diphtheria, sixteen cases, fourteen recovered, two died; measles one case, result not yet reported to me; and of scarlet fever four cases, three recovered and one died. So far as I can judge the township is free at present from all diseases to be reported to me.

Nothing that I am aware of has been done regarding inspection of milk supply. A late medical congress condemned impure cows' milk as the transmitter of many diseases, as typhoid fever, consumption, etc. With such medical reports concerning the unwholesomeness of a great deal of the milk, and of the water that city humanity is furnished with, can it be any wonder that in cities the Scott Act is not popular?

In times when Ontario may be threatened with a serious epidemic, I should judge it advisable that some means satisfactory to the banks and the public be adopted, that bank bills be disinfected in a way which, while thorough does not injure them, or that they be replaced by the banks by new ones; for, by the circumstances of their use, they are in a most favorable position for carrying many diseases, and in large quantities of long-used bills the odor is very powerful, complicated and unsavory.

I was notified that in one instance where a house was placarded with the Board of Health notice for scarlet fever, the notice was taken down because the parties whom it was supposed had caused the fever had not their house placarded in Brantford. It is supposed to damage the trade of a city to inform the public of an infectious disease in its midst, hence the tendency in *some quarters* to suppress such information as much as possible.

ROBERT HARBOTTLE, M.D.

Medical Health Officer.

CALEDON.

Medical Health Officer's Report.

I feel considerable satisfaction, at this our annual meeting, that we have only once during the past year been called on as a Board to act in any emergency; this itself being almost a guarantee of the public health of the municipality. That emergency meeting was called by me to get advice of the Board on an important question, which arose in the following manner:—

On the morning of the tenth of January last, the head master of Alton Public School, came to my office saying that one of his little boys was sick and that he was afraid it was scarlet fever, and that he wished me to see him before school hours and let him know whether he (the teacher) might be able to attend school. His suspicions proved correct—the boy had scarlet fever, and I was forced to isolate the family by keeping the teacher away from school.

The other teacher, a lady, boarded at his house, and thus we were forced to close the school forthwith. Then came the vexed question of how long must the school be closed. A great number of the ratepayers were dissatisfied, claiming that such rigorous proceedings were unnecessary; others again contended that if through any negligence on the part of the trustees or Medical Health Officer their children contracted scarlet fever, they would resort to legal proceedings.

I then felt that it would be wisest to call a meeting of the Board to advise me in the matter and take the responsibility. The Board advised the trustees that the lady teacher should change her boarding house, first thoroughly disinfecting her clothing, and after being isolated for a week she might then resume her duties, and with an assistant manage the school.

Regarding the head master, we advised that after three weeks isolation and thorough disinfection of house and personal clothing, under supervision of the Medical Health Officer, he might then take charge of the school; the result was that no other cases followed at least in that section.

A difficulty regarding school matters presented itself at Credit Forks, in March, 1888, during the period of the local epidemic of measles and whooping cough in that village. Five deaths in three weeks had occurred directly or indirectly due to whooping cough, and the public became alarmed. The trustees after consulting with me decided to keep all children suffering from whooping cough or measles from attending school, as well as children belonging to families who were suffering from it. Then arose the difficulty; the teacher's boy, it was alleged, had whooping cough, and the trustees notified me to call at the house and examine the boy, but the teacher refused to have the boy examined, saying the trustees had acted in an arbitrary manner and that he would resent with force if necessary. Reasoning or explaining matters proved useless, so I was constrained to take my leave without having accomplished the required examination. However, as usual there was a "power behind the throne," for the trustees notified him that the school was closed and that the said closing being due to his perversity, his salary would be suspended. Whether this or the copy of the "Health Act" I sent him caused his repentance I cannot say, but he soon wrote me apologising for his action and asking me to come and examine the boy, which I did. I found him suffering from whooping cough and measles, and as he got well, the teacher after due disinfection, was allowed to open the school and I was much pleased at the matter being settled without resorting to legal proceedings. In this connection I might say that a good many teachers are not aware that it is their duty to notify the Medical Health Officer of any child attending school in whose family their exists any contagious disease; and it might be well to have the clause relating thereto printed along with our health by-laws and sent to each school in the township.

At our last annual meeting it was decided to take some steps regarding the unsanitary condition of "Credit Forks." Accordingly, our Inspector made a tour of inspection in May, and reported to me that matters were even worse than he had anticipated, the principal trouble being the close proximity of the privies to the houses, on account of the small size of the building lots, and the cesspool immediately in the rear of the house.

Mr. K. Chisholm, being landlord of the said houses, I wrote him requesting him to make some arrangement whereby the privies could be removed to a greater distance from the houses. Mr. Chisholm did not see fit to take any active steps in the matter, and I had resolved to report forthwith to the Board, when I discovered that the talk and discussion about the matter had aroused the inhabitants to clean out privies and cesspools, and thus the required object was accomplished in another way. The water supply there has also been improved by cleaning out the springs and protecting them from cows and pigs, which used to have access to them. The general result is that since these steps have been taken there have been no infectious diseases, and there has been a marked decrease in non-contagious diseases.

A very violent type of scarlet fever was imported here from Bracebridge, in the following manner:—

A plasterer, whose family were living in Alton, had been working in Bracebridge during the winter; he was taken down with a severe illness, the nature of which we did not at that time know but which confined him to bed for many weeks. As soon as he had fairly recovered he came home to his family, and not having had any conversation with him on his return, I was not aware of the nature of his illness. However, about a week afterwards, I was called to see their little girl, the youngest of the family, and found her suffering from a violent attack of scarlet fever, from which she died in a few days. The following day three other children of the same family were taken down with the same disease, and though their illness was long and tedious they finally recovered.

These cases occurring so soon after the father's return, and at a time when there were no other cases in the neighbourhood, aroused my suspicion and I questioned him regarding his illness. He said that the doctor told him he had diphtheria, but stated that in the house where he boarded a child had died from a severe sore throat, accompanied by a rash which he said was exactly like the rash his children had. I then asked

him if his clothing had been disinfected, and he said that nothing had been said to him about it, and he was not aware that it was necessary.

Here was a father returning to his family after a protracted and painful absence, and they received him joyfully, glad after many weeks of uncertainty and suspense to see his face again, not knowing that he had brought with him the germs of a disease that would place one of the little darlings that ran forth to meet him in her grave, three others on a bed of long and painful suffering, and bring the family to the brink of starvation. By strictest isolation and thorough disinfection not another case occurred. No one was allowed to leave the house, everything necessary being conveyed to them by a messenger who never entered it. I may be pardoned for relating this case at length, but I feel that such tragedies as these should be prevented, and when we know that disinfection and isolation will give absolute protection, we cannot help feeling that the neglect of these precautions is almost criminal. Perhaps the physician in attendance was not the Medical Health Officer and may have neglected to report the case. Thus we see what lives are lost and what suffering is caused by the neglect of physicians to report infectious diseases to the Medical Health Officer, or to take it upon themselves to carry out a proper system of disinfection.

One can easily imagine that many other cases have arisen through contact with this person in a railway carriage, and scattered throughout the country.

During the latter part of August and September, the village of Alton suffered from a local epidemic of typhoid fever and several cases of malarial fever, but in this case the cause was easily accounted for. A large mill-pond was emptied for repairs, and several feet of black mud was left steaming in the heat of the sun. In this matter I felt that all I could do was to urge the owner to complete the repairs as quickly as possible.

The health of the farming community has been remarkably good, excepting in cases where they had neglected to clean out privies, wells or cellars; and in such cases several families have suffered from typhoid fever and diphtheria.

I have refrained from giving any tabulated report, as the physicians' reports to me have been incomplete and might be misleading. I have endeavoured to induce all physicians practising in the municipality to report to me before the fifteenth of November, a list of the contagious diseases occurring throughout the year, but with very unsatisfactory results. In the absence of these reports we must be contented to labour on under this difficulty, and do all we can to further the interests of the public health without them.

JAMES ALGIE, M.D.,
Medical Health Officer.

CALEDONIA.

Secretary's Report.

In compliance with the Public Health Act, 1884, I have the honour to report that at the first meeting of the municipal council a Local Board of Health was appointed, with D. I. McIntosh, M.D., of Vankleek Hill, as Medical Health Officer.

It is with pleasure that I can report that the general health of the municipality during the past year has been better than for some time past.

Two cases of diphtheria occurred in a family in the month of June, one of which proved fatal. There were also several mild cases in another family this autumn. Proper care having been taken by the inmates of the houses in which the sickness occurred and by the physicians in attendance, the disease was prevented becoming serious.

With this exception, the municipality was completely free from contagious and infectious diseases during the year.

JOHN DOWNING,
Secretary.

CAMBRIDGE.

Medical Health Officer's Report.

During the past year our township has been pretty free of disease, except of fever and a few cases of diphtheria and scarlatina.

The cases of fever throughout our district were mild. Diphtheria and scarlatina were the only diseases that have brought many children to death.

As you are aware, all our trouble came from Casselman. The causes are, want of drainage, the density of population, and the impurity of the well-water. I must congratulate you for your action in the present year, and in the meantime on the good sanitary condition of the township, as well as with having educated people up to immediate compliance with your orders without the law's interference.

JULES M. BOILEAU, M.D.,
Medical Health Officer.

CARADOC.

Secretary's Report.

In conformity with the Public Health Act, I have to report as follows :—

The Board of Health have the satisfaction of reporting that the general health of the municipality has been very good during the year ; no epidemic has been very generally prevalent.

The Sanitary Inspector reports the following cases of epidemic diseases : Six cases of typhoid fever, one of which proved fatal ; four cases of diphtheria, two of which proved fatal ; a number of cases of whooping cough, none of which proved fatal.

He also, by instructions from the Board, made an inspection of milk vendors premises during the summer, and found them clean and well kept and the cows in a healthy condition. He also tested the milk and found it up to the average of pure milk ; said test was made after the delivery waggons had proceeded on their rounds, the vendors having no previous notice.

The present sanitary condition of the municipality is very satisfactory.

M. MCGUGAN,
Secretary.

CARTWRIGHT.

Secretary's Report.

In pursuance of the Public Health Act, 1884, I beg to submit the following report :—

Our township during the year has been comparatively free from infectious or contagious disease. The local practising physician reported three cases of typhoid fever, one case on the fourth of August and two cases on the first of September, but by the prompt action of your Local Board in isolating the premises where the disease existed, the spread of the disease was happily averted.

At a meeting of the Board held on the 2nd day of June, a committee was appointed, consisting of the chairman, the secretary, and Mr. R. H. Prust, to examine all wells, cellars, yards and privies, where there was danger of filth accumulating, in the village of Blackstock, and to take such measures as authorized by the Public Health Act to have all such premises thoroughly cleansed, and put in a proper sanitary condition.

The committee so appointed forthwith proceeded to inspect said premises, and with a few exceptions found little to complain of, and such exceptional cases were at once cleansed and the proper remedies applied.

On the whole I am pleased to state that your township is at present free from contagious disease.

WM. LUCAS,
Secretary.

CAYUGA, NORTH.

Secretary's Report.

The sanitary condition of the township of North Cayuga, during the year 1888, has been in a good state generally.

There has been one case of diphtheria and one of typhoid fever, but in neither case has the disease spread.

There was a report of one case of small-pox being in the township, but the report turned out incorrect. There has been nothing of the kind in the township so far.

JAMES MITCHELL,
Secretary.

CHAPMAN.

Secretary's Report.

The health of the township at large has been generally good.

In the month of June the village of Magnetawan was inspected, and all manure and other garbage was removed, but not without some opposition on the part of householders.

The carcasses of three animals were buried by order of the Board at an expense of \$13.

Dr. Walton, of Magnetawan, has been instructed to vaccinate all residents of this township at a fee of 25 cts each.

The Board has held three meetings. At their last meeting a drain was ordered to be made through the lot owned by R. Geasley, in Magnetawan, at a cost of \$2.

The Board reports the township generally in a good sanitary condition; the hotels are clean; the yards dry and well drained, and manure frequently removed.

T. G. PEARCE,
Secretary.

CORNWALL.

Medical Health Officer's Report.

Owing to the ready compliance of parties concerned with the demands of the Board of Health, the duties of its officers are now with a few exceptions comparatively light. Besides the thorough cleansing of premises insisted upon early in the season, very few changes were asked for and these few were willingly and quickly complied with, so that at present the district is in a most satisfactory condition. Slaughter-houses were put in a thorough sanitary condition early in the year, and so maintained during the summer; complaints on that score were a rarity.

School houses were properly looked after by teachers and trustees, at the instance of members of the Board in whose district they happened to be.

The number of contagious diseases of all kinds in the district was much less than in former years. Cases of diphtheria were isolated and their malignancy was not at all great, except in a few instances. Typhoid fever was not nearly so prevalent, and in the most crowded parts of your district the cases were surprisingly few. Scarlet fever, measles, etc., were scarcely known.

I must congratulate the Board upon the very satisfactory state of things, and the members upon the efficient way in which they have done their duty, none too pleasant. I would ask you to continue to enforce the regulations with a firm hand early in the season, and the fruits of your work will continue to be apparent.

H. J. HARRISON, M.D.,
Medical Health Officer.

CROSBY, NORTH.

Secretary's Report.

Our Board met for the first time for the transaction of business on the 16th of April, and instructed the Sanitary Inspector to examine the slaughter-houses and cheese factories and report as to their sanitary condition.

His report showed that the cheese factories were kept according to the law, but the slaughter-houses were not the right distance from the public street and not kept in a proper sanitary condition.

Another meeting was called on the eleventh of June, when the slaughter-houses were ordered to be closed, which was done at once, and a new one erected at a proper distance from any habitation. They have been since kept in a proper sanitary condition.

The present year has been a very healthy one. There has been no contagious or infectious disease, except a few cases of measles and scarlatina of a very mild type, and the sanitary condition of the township is good.

JOHN McGUIRE,
Secretary.

CROWLAND.

Chairman's Report.

The Local Board of Health for the township of Crowland beg to present this their annual report for the year 1888. The number of cases from infectious diseases up to date, as reported, is as follows: Scarlet fever four, all in the family of Andrew Cruickshank. Three cases broke out in January last, and all recovered under the treatment of Dr. Shaw, who never informed me of its existence until weeks afterwards; consequently the house was not placarded. Another case in the same family occurred during last month, under the treatment of Dr. Shaw, who notified me without delay. I placarded the house; patient got well. I wrote to Dr. Shaw in May about his neglect in January last; he apologised and stated that the house was afterwards properly cleansed. There were four cases of diphtheria. The first case was in the family of Walter S. Elliott, under the medical treatment of Dr. Park, who notified me of its existence. I forthwith placarded the premises. Shortly after the child recovered. The second case occurred in the family of Edwin Morris, under the medical care of Dr. Burgess, who immediately notified me. I forthwith placarded the premises. The child recovered. The third and fourth cases occurred in the family of David Shafer, under the medical care of Dr. Park, who notified me. I had the house placarded forthwith. Both of the children *died*.

I beg to state that the medical men, Dr. Burgess excepted, have shown great remissness in duty, in not reporting to me forthwith of the existence of the above cases.

There were no complaints sent to the Board during the year of any case of nuisance, or of anything existing prejudicial to the public health of the municipality. The degree of health prevalent in the township during the year has been exceptionally good.

W. H. BIGGAR,
Chairman.

DALHOUSIE AND SHERBROOKE NORTH.

Secretary's Report.

I am happy to be able to report that our townships have been during the year now nearly past in a fair sanitary condition, there being only one case of typhoid fever which was contracted in Kingston; the patient fully recovered. Each member of the Board is taking an active part in enforcing the law. A cheese factory and hog-yard at Elphin Corners, complained of, was visited by the Board of Health and found in a very bad state of repair and unsanitary condition. The parties were notified to at least partially abate the nuisance, but the instructions were not complied with till an action at law was threatened. We think the factory should be removed.

GEO. CAMPBELL,
Secretary.

DEREHAM.

Medical Health Officer's Report.

The season has again arrived when I am required by law to report on the sanitary condition of this municipality for the present year, and in doing so I am pleased to state that the people of this township, at least that part which is under my jurisdiction, have abundant reason to be thankful for the small number of cases of zymotic diseases that have occurred during the year.

Early in the season a few cases of scarlatina of only moderate severity occurred, but owing to due precautions being taken the disease did not spread to any extent.

During the summer months a small but severe epidemic of diphtheria visited part of this township, but owing to rigid care and isolation the epidemic did not become so general as it would otherwise have done; and fortunately the mortality was small, as I have only heard of two cases proving fatal. As none of the physicians have reported their cases to me, I regret that I am unable to report the exact number of cases that occurred. I may state that twenty-six cases came under my own care, the ages of the afflicted ones ranging from the child of three years to the adult of forty-six years, and in severity it varied from the rather mild type to the severe putrescent form, but all made a good recovery; and as I believe in giving honour to whom honour is due, I wish to attribute a very large share, perhaps the largest share, of the credit to excellent nursing, for I am pleased to state that never since I commenced practicing have my instructions been so rigidly observed and carried out, and the medicines so punctually and promptly given, both day and night, as during the epidemic to which I have just referred.

Owing to the growing intelligence of the people they now at once recognize the gravity of the situation and the treacherous nature of the disease, and obtain medical aid without delay; and for these reasons I think I dare venture to predict for the future a smaller rate of mortality than during the past.

There were a few cases of diarrhoea and dysentery among the children during the hot summer months, but not nearly so prevalent as in former years, and I am not aware of any deaths occurring from those causes.

Typhoid and malarial fevers have not, so far as I am aware, prevailed to any great extent in this municipality during the year.

In this immediate vicinity we have had fewer cases of fever than in any year during the past ten years.

I regret to state that the provisions of the Public Health Act, concerning the cleaning out of wells are not receiving the attention which their importance demands.

H. MINSHALL, M.D.

Medical Health Officer.

DORCHESTER, NORTH.

Secretary's Report.

The Local Board of Health of the municipality of North Dorchester are very much pleased to be able to report that the sanitary condition of this township is favourable, and the inhabitants are willing to carry out the suggestions of the Board as reported last year. You can better judge of the health of the inhabitants of this municipality after reading the number of cases of infectious diseases reported by the physicians in the township. Two cases of scarlet fever, and eight of measles for the year 1888. The Board is in working order.

D. P. AYLSWORTH,

Secretary.

DUMFRIES, NORTH.

Medical Health Officer's Report.

It is a gratifying feature of my experience to find more indications of awakened interest, and willing co-operation in all inexpensive changes, that may conduce to the promotion of health and the prevention of disease. I have again visited the schools of the township, and though a few of the pupils have been absent from illness, there have been no epidemics of disease interrupting any of the schools. It has been difficult to obtain reliable information relating to the health of the schools. The Department of Education have, however, proposed blank forms for teachers' register, by which an accurate record will be kept of all children absent from illness; and also blank forms to be filled up and sent by the teachers to the Medical Health Officers, giving definite information relating to the health of the pupils. I am pleased to report an improved condition of the water-closets, though in a few instances regular and efficient disinfection has been neglected. I have supplied every school with copies of pamphlet No. 15, issued by the Provincial Board of Health for checking contagious diseases. The floors of most of the school rooms were not found in the most desirable condition. The prevailing pallor of school children from foul school air, is but too often the index of depraved blood and retarded physical development: and this, too, be it remembered, at a time of life which prevents the attainment of sturdy, robust maturity. I have done what I could to minimize this evil, without contemplating the radical changes involved in the erection of better structures and the adoption of the more costly modern methods of heating and ventilation.

In company with Inspector Detwiler, I visited one of the cheese-factories where complaints had been made in regard to the "hog nuisance." The proprietor had, however, moved the hogs to a safe distance from the factory and private dwellings at considerable personal inconvenience. To abate this nuisance it is to be hoped that all factories will adopt the suggestions made by the committee appointed to investigate this matter, viz.,

the laying of pipes to convey the whey to the hogs at safe distances from the factory, private dwellings and public highways. The evidences of cleanliness within the factory, with its tight floor and ample means for surface drainage, were quite satisfactory. I obtained and examined forty-two specimens of water used in cleaning the milk-cans that convey the milk to the factory, and only two of them were found objectionable, I presume from neglect in regularly cleaning the wells. Your Inspectors inform me that the other cheese-factory is in a satisfactory condition.

Your Inspectors have jointly visited the premises of all milk-vendors in the municipality, and carefully noted the condition of all the cows, the unwholesomeness of their food and water, the care taken of milking utensils, and all matters essential to the sale of pure wholesome milk. They have granted license to seventy-two vendors of milk, in accordance with the statutory conditions providing for the same. In this connection I would suggest that all licensed vendors should indicate their license upon their public delivery waggons, as a further assurance to the public that they have complied with the law relating to the sale of milk.

The Inspectors have repeatedly visited the slaughter-houses during the year and reported them generally in a satisfactory condition, which is much more than could be said in previous years. They assure me that a decided improvement has been effected since inspection was instituted in the management of slaughter-houses. They have granted licenses during the present year to eight houses. They have found their duties in this direction somewhat onerous. In my opinion these institutions will bear close watching, not only on the part of the inspectors, but by all owners, especially during the hot months, so great is the tendency of flesh to become unfit for use by the speedily acquired unsanitary condition of all slaughter-houses. I take pleasure in bearing testimony to the efficient services rendered by your Health Inspectors, and again congratulate this Board upon the exemption of the entire municipality from almost all preventable diseases during the year.

J. B. LUNDY, M.D.,
Medical Health Officer.

DUMFRIES, SOUTH.

Medical Health Officer's Report.

It is with pleasure that I submit to you my annual report. We ought to be thankful that during the year past the township has been to a great extent free from the more virulent forms of infectious diseases. There has been a much smaller number of complaints than usual, and these have been dealt with in such a manner by the Board that the people must feel they have a protection in sanitary matters on which they can rely. The Board has accomplished a great deal of good for the township, and is still striving to rectify matters prejudicial to the health of the community. Considering the improvements that have been made in this direction, together with the good feeling existing between the Board of Health and the residents of the township, I think it quite a natural conclusion that in the future the labour of the former will be very much lightened. I would suggest that care should be taken to keep the school house clean and well ventilated, and that vaccination be strictly enforced.

E. C. KITCHEN, M.D.,
Medical Health Officer.

DUNGANNON AND FARADAY.

Secretary's Report.

Last fall and winter this municipality was visited by a malignant type of diphtheria, which died out in the present year after ten had fallen victims to the disease, all of these

being children. There have been eleven other deaths from various causes, sevenths of which were infants.

During the present year there was an outbreak of measles but no deaths took place, and the health of the municipality is at present most satisfactory.

A. C. BARKER,
Secretary.

DUMMER.

Medical Health Officer's Report.

In compliance with the requirements of the law I submit to you my report. Early in the spring of 1888, a case of diphtheria made its appearance, and from its cause came a number of others in the immediate locality. The house was visited and an examination made of it and surroundings. They were found to be well fitted for the development of diphtheritic germs. The well was close to the door, and the earth surrounding the well was apparently the receptacle of soapsuds and dish-water of the house. There were two deaths during the outbreak. The house was placarded and isolated. Funerals ordered strictly private, and isolation for six weeks after all signs of disease had left the house, and all clothing and the house had been strictly and thoroughly disinfected. In the northern part of the township there has been some cases of measles and whooping cough, but of a mild and favorable type. There has been no other epidemic or contagious disease under my notice. I would direct the attention of this Board to the condition of our schools and surroundings. It would be well to direct the attention of school trustees to the provisions of the Health Act. In closing this report I would express the hope that next year we may be more strenuous in our efforts to promote sanitary reforms than we have been in the past.

J. A. COUCH, M.D.,
Medical Health Officer.

EASTNOR.

Medical Health Officer's Report.

I have the honour to submit the following report on the sanitary condition of this municipality during the past six months, during which I have acted as Medical Health Officer.

At the present time our municipality is entirely free from contagious diseases, there having been but three cases of typhoid fever and an epidemic of measles. The latter disease became general, owing to parents allowing their children to attend school when other members of the household had the disease.

I was requested by the trustees of Swan Lake School to visit the section and examine the children, as the school had to be closed owing to non-attendance from sickness. I found upon examination that they were affected with measles of rather a severe type; no deaths from any of the above diseases.

From reports that a contagious disease was spreading amongst the cattle in the western portion of the township, I visited that section and acting under instructions from the Local Board of Health, requested C. R. Notman, V.S., to visit that district. We examined a few typical cases, and Mr. Notman's report on the same I herewith enclose for your perusal, as requested by your Board. I have made a house-to-house visit and vaccinated between three and four hundred children. I find upon examination that scarcely two per cent. of the children of the township have ever been vaccinated.

I would also respectfully draw the attention of the Board to the fact that this village Lions Head, being the main centre of trade for that portion of the Saugeen Indian Peninsula lying to the north of this municipality, ought to exercise proper precautions in reference to the spread of zymotic diseases. Scarlet and typhoid fever, as well as measles, have been prevalent in those sections during the past year, and in which no Local Board of Health exists.

The fact that all the cases of fever which have occurred since my residence in this municipality have been traced to outside causes, goes far to prove the general healthfulness of the municipality.

JAS. S. FREEBORN, M.D.,
Medical Health Officer.

EDWARDSBURG.

Secretary's Report.

In compliance with the requirements of "The Public Health Act," I beg to present the annual report of the Local Board of Health of the municipality of the township of Edwardsburg.

The general health of the municipality has been good, with the exception of a few cases of diphtheria in the early months of the year, two of which proved fatal; the others being of a mild type soon recovered. The Board ordered the houses where the disease was to be thoroughly disinfected and fumigated.

For the information of the people the Board ordered two hundred hand-bills to be printed and posted up in the public places, containing extracts from "The Public Health Act" regarding school protection; the removal of putrid and decaying animal and vegetable matter, and the cleaning of cellars, outbuildings, yards, etc.

The sanitary condition of the township at present is good.

GIDEON FAIRBAIRN,
Secretary.

EGREMONT.

Secretary's Report.

In submitting my annual report for Egremont, I would say that so far as known to us the sanitary condition of this township is good.

We have had several cases of typhoid fever during the past year, but all recovered. One case seems to have been imported; the others were not attributable to any unsanitary or known cause.

These cases were not reported to the Board, hence the difficulty of making an accurate report. Although we supplied all the physicians in and around the municipality with blank forms for such reports, yet they do not give the Board this information.*

Only one complaint was made during the year and it was attended to. With the exception of burying a few dead animals, the duties of our Board have been comparatively light.

D. ALLAN,
Secretary.

* Many of the reports from municipalities contain similar complaints as to the delinquency on the part of medical men in reporting infectious diseases. The law is plain in this matter, and it is the duty of Local Boards to see that it is obeyed. If a few examples of the delinquents were made before a magistrate, the desired effect might be gained. [ED. REPORTS.]

 ELDERSLIE.
Chairman's Report.

The Board of Health for the township of Elderslie for the year 1888, reports as follows:—That the sanitary condition of the township for the present year has been such that this Board has had no cause for active interference. There have been several cases of typhoid fever, none of which resulted fatally. In one family scarlet fever caused the death of one child. In one or two cases of diphtheria the medical men in charge took the necessary precaution to prevent the spread of the same. The Board was not notified of any nuisance existing in any part of the township.

JAMES GARNET,
Chairman.

 ELMA.
Chairman's Report.

The general health of the township for the year has been pretty good, although we have had some cases of diphtheria and some of typhoid fever, but to no alarming extent. There were some cases of both diseases which were carried into the township from outside points by persons who were affected. At the present time the general health of the township is very good.

There are a number of cheese-factories in the municipality, and before the owners or managers commenced operating these factories in the spring, they were notified by the Secretary of our Local Board that the factories and surroundings must be kept clean and in as good a state as the law directs.

Also, all owners of slaughter-houses were similarly notified ; the owners obeyed orders strictly.

All the swamps are getting reclaimed and drained, so that all the surplus or stagnant water is a thing of the past.

ROBERT CLELAND,
Chairman.

 ENNISKILLEN.
Medical Health Officer's Report.

As far as I have been made acquainted, I think your Board have had but little to exercise themselves about during the past year.

The general health of the municipality has been good, perhaps above the average. Typhoid fever has prevailed in a few families on the 12th line, and appears to have been very fatal in its results. It did not spread to any extent and has now I believe entirely subsided. It is difficult in many cases to ascribe the cause ; in this instance it would appear like an extension of the disease which prevailed in Petrolia to so alarming an extent at one time during the fall. That it might have originated from the intercommunication of the people, is to my mind quite feasible ; nothing is more likely. Though not actually a contagious disease, yet the proof is abundant that one member of a family will introduce it to the rest though every precaution may have been taken in regard to cleanliness. As an example I might mention the case of a young man who was ill with the fever in Petrolia this summer ; as soon as convalescent he was taken to his home nine miles in the country, where he imparted it to four brothers and one sister, the latter dying of the disease. In this connection it would not be amiss to impress on the Board th

necessity of complying with the Act regarding the cleansing of wells and water closets in the early summer of each season. This is not attended to, and doubtless many deaths and much sickness are attributable to the fact.

The Medical Health Officer's report will never be complete or in any way satisfactory, unless the physicians practising in the municipality report to him from time to time the cases met with in their practice. I would ask the Board to communicate with these gentlemen and ascertain if they will co-operate with us in getting at something like an accurate statement of the various diseases occurring under their notice. It would be a valuable aid from a statistical point of view, besides furnishing the Local Board with information which could be acted upon without delay.

As near as I can ascertain the deaths from infectious diseases for the past year in Enniskillen have been confined to those occurring from typhoid fever; these number six in all, about one-half of those who were stricken down.

G. D. LOUGHEAD, M.D.,
Medical Health Officer.

ESQUESING.

Chairman's Report.

In conformity with the provisions of the Health Act, I beg to report that the Local Board of Health for the municipality of this township held two meetings during the year.

The Sanitary Inspector made his usual inspection and reports favorably of the sanitary condition of the several villages of the township. One case of typhoid fever was reported. The patient recovered. No other case from that locality or from any other part of the township was reported.

The Board, however, has reason to believe that other cases of typhoid fever, measles and at least one case of diphtheria have occurred, of which no report has been received from the attending physician.

On the whole the general health of the inhabitants of the municipality is considered good, owing perhaps to the improved sanitary condition of the more populous districts.

There is no Medical Health Officer employed.

The Board is of opinion that the powers and duties of Local Boards should be more clearly defined, and clause 48 of the Health Act, Revised Statutes, cap. 205, amended, which is at present merely discretionary as to the voting by councils of a sum or sums of money to Local Boards for the carrying on of the work deemed necessary by such bodies.

I also beg to suggest to the council that the new Board of Health for the ensuing year be authorized to have printed a few simple rules on sanitation for the guidance of the ratepayers, and to be delivered by the assessor when making his annual assessment. This is looked upon as a cheap plan of improving the health of the community if adopted, and of reducing the cost of doctors' bills.

R. GRAHAM,
Chairman.

ETOBICOKE.

Medical Health Officer's Report.

I have the honour herewith to submit my third annual report regarding the health of this municipality.

With two exceptions there has been a total absence of infectious diseases during the past year. I have had only one case of typhoid fever, imported from Toronto, and one case of small-pox, this patient also blaming Toronto for the contagion. I am thankful to

say that the disease has been confined to the first case, notwithstanding the fact that there were twelve members of the family, two children under two years not having been previously vaccinated. By making temporary quarters in the driving shed, we moved the family after a complete change of clothing and all having been vaccinated, where they remained until the patient had quite recovered and the house thoroughly disinfected.

I would again advise your Board to post notices in the Villages of Islington, Lambton Mills, Mimico and Humber Bay, to have all privy and vaults cleaned and disinfected, and to have the council pass a by-law making it compulsory to use the dry-earth system of closets. The Inspector to make at least two rounds during December and May, following the posting of the notices.

In the matter of cow byres and milk vendors in this municipality, I would refer you to a circular issued by the Provincial Board of Health last year as to registrations, inspections, etc., etc., in connection with the sale of milk. Also in the matter of slaughter-houses. I am led to believe there is some killing in places where it should not be without a permit from your Board. I have had several complaints about one in the north end of this municipality.

J. H. COTTON, M.D.,
Medical Health Officer.

EUPHRASIA.

Medical Health Officer's Report.

I have the honour to submit the following reports of the sanitary condition of the township for the year ending December 1st, 1888:—

On the 3rd of January, 1888, being notified that diphtheria had broken out in a certain locality, I visited several families where it was said to exist. In the first family I found two children had died of membranous croup following diphtheria, and four more were suffering from sore throats and croupy symptoms. As no medical man was in attendance, I treated those who were still ailing, and furnished medical disinfectants and other necessities to ensure the safety of the public in the locality. I also gave necessary instructions for attendance, isolation, cleansing and disinfecting the house and contents.

In the second family I found all well. In the third simple cases of sore throat, but not of an infectious or contagious nature. In the fourth family one child had died of diphtheria a couple of days before, and another was still bad with it. I followed the same course here regarding instructions, etc., to prevent its spreading. On February 4th I was again notified that diphtheria existed near Kimberly. I visited those families the following day, and in the first found that ten children had suffered from it, one of whom had died; several of them were yet ailing. I gave the necessary instructions regarding isolation and sanitary measures. In the second family I found two suffering from it, and with them and the family followed the same as in previous cases. In the third family two children were afflicted with it, both of whom afterwards died. As these were under medical attendance, I gave the usual instructions to prevent its spreading, etc. On the 5th of February I was called to another family said to be suffering from it, and found one child down with it, whom I attended until well. On March 1st I was notified that it had broken out in another locality, but on visiting the family found nothing of a contagious or infectious nature.

During the year I visited nine families in the township, amongst whom there were twenty-five cases of diphtheria and six deaths. The only other infectious or contagious disease that came under my notice were a few cases of measles, all of which got well. The people of the township, as a whole, are in comparatively good health.

The origin of most of the above cases I traced to contagion by a family who had come from the United States, some members of which were afflicted at the time with the disease. In almost every place, so far as I could find where they visited, the disease

broke out in a few days afterwards. In one of the families the origin could not be clearly traced, but it was thought to be due to impure water. By none of the families was it communicated to the others, so far as I can ascertain; and the disease was confined to the house in which it first appeared. To several of those places I sent the ordinary legal notice to be posted up at the entrance to the place, warning the public of the existence of contagious disease in the house, but I regret to say that I found some of the parties strongly averse to this plan of protection.

T. S. SPROULE, M.D.,
Medical Health Officer.

EXETER.

Secretary's Report.

In February the Board ordered posters to be placarded, warning the citizens of liability to prosecution for neglecting to report contagious or infectious diseases to the proper authorities.

In March the Board received intimation from the council that Dr. Hyndman had tendered his resignation as Medical Health Officer; the Board recommended the acceptance of the resignation, and requested the appointment of Dr. Lutz in his stead. The Board recommended the cleaning out of the drain at Hawkshaw's Hotel, and also ordered the issue of notices to all residents to clean and disinfect their premises. In April the Sanitary Inspector reported that all had complied with the order of the Board, with the exception of a few cases. He was instructed to see that the premises complained of were put in a sanitary condition immediately. On the 13th of June the Board visited a few places which were reported in an unsanitary condition, and gave instruction to remove cause at once, which was done.

At a meeting held on the 9th July, a request was made to the council to plank the bottom and sides of the drain at Hawkshaw's Hotel, so as to secure proper cleansing by flushing and scraping, to which the council paid no attention, so the drain remains as it was—a source of continual complaint and annoyance, and it may be of disease.

On the 3rd September the chairman reported that in consequence of the many cases of typhoid fever at present in the village, many were anxious that an effort be made by the Board of Health to prevent the further spread of the disease, but the Board considered themselves powerless in the matter. At the same meeting a notice was published expressive of a determination to prosecute any person manufacturing cider, who would leave exposed any refuse of such manufacture on his premises or elsewhere in the village.

On the 29th October the Board published the following resolution: "That in view of the existence of smallpox in Toronto and elsewhere in this Province, this Board consider it their duty to earnestly recommend the immediate vaccination of all residents of this village and vicinity who have not been recently vaccinated."

With the exception of an outbreak of typhoid fever and measles the condition of the health of this village has been on the whole very satisfactory.

M. EACRETT.
Secretary.

FLAMBORO, EAST.

Medical Health Officer's Report.

It again becomes my duty to submit to you the yearly health report of the Medical Health Officer of the municipality. We have enjoyed exceptionally good health during the past year, and as a consequence the death-rate is low. Fourteen deaths have taken place, which gives the very low rate of six deaths per thousand of population. Of

these deaths four were persons over 65 years of age, and five of infants of one year or under. Of these deaths none occurred from diseases which are preventable by this Board—not a death taking place from typhoid, diphtheria, scarlet fever, measles or smallpox. A few cases of typhoid have occurred, but of a mild type. No nuisances have been reported to me this year; and while visiting at different times a large number of the houses in the township during the past twelve months, I have not noticed anything that would be injurious to the public health.

J. D. COURTENAY, M.B.,
Medical Health Officer.

FLAMBORO, WEST.

Chairman's Report.

I herewith submit my report as chairman of the Local Board of Health :

We have held four meetings during the year. Careful inspections have been made by the Sanitary Inspector of all slaughter-houses, dairies, school premises, stores, hotels, mills, factories and most of the private houses in the villages, and almost all were in a fair condition. There have been comparatively few cases of infectious or contagious diseases during the year. The number reported was typhoid fever, four cases, supposed to be caused by using bad water; scarlet fever, twelve cases, caused by transmission of infection from other sections; diphtheria, four cases, which appeared in different sections at different times during the year and for which no special cause can be determined. None of the cases mentioned resulted fatally. No cases of smallpox have occurred in this or the adjoining municipalities, but should any occur the Board is prepared to put in force the Act respecting vaccination, and to use all means in their power to prevent the spread of the contagion.

The expenses of the Board this year are in accordance with the accounts presented.

We have good cause for thankfulness for the satisfactory sanitary condition of the township, and from the almost total immunity from diseases of an infectious or contagious character which we have enjoyed during the year.

CHARLES S. CUMMINS,
Chairman.

FREDERICKSBURG, NORTH.

Medical Health Officer's Report.

During the past year there have been no serious epidemics in the township. What might have been the beginning of another epidemic of diphtheria was, by the efforts of the Board, confined to the first house in which it appeared. Three young men visited Kingston on the 12th of July and, though all belonging to different homes in South Fredericksburgh, were taken down with a severe form of diphtheria in about one week's time. The South Fredericksburg Board of Health used rigorous means of isolation and disinfection. Nevertheless, it was conveyed to several in the same homes and to one other house in the township. After apparent convalescence one party visited friends in N. Fredericksburgh (contrary to advice), the result being the death of one child and serious illness of the only other one in the family. It is by such experiences that we learn the great care necessary to prevent the spread of these diseases. There were a few cases of typhoid fever during the past autumn, mostly mild.

I have inspected the slaughter-houses and cheese factories during the summer and have found them kept in good condition. One slaughter-house is too near the highway and to dwellings, but the owner is about removing it. There are a few pig-pens also too near the road, and the owners should be notified to remove them.

G. C. T. WARD, M.D.,
Medical Health Officer.

GAINSBORO'.

Secretary's Report.

I have the honour to submit the fifth report of the Secretary of the Local Board of Health of the Township of Gainsboro'.

The Township of Gainsboro' has had another year of good health, for which blessing all good citizens are truly thankful. The Local Board of Health did not consider it necessary to enforce the compulsory provisions of the statute regarding vaccination, for the reason that there is no railway running through the township and but little danger of smallpox being brought in from distant places. Measles was the only infectious disease that occurred during the year.

S. KENNEDY,
Secretary.

GARAFRAXA, WEST.

Medical Health Officer's Report.

I beg leave to report that the general health of the township during the past year has been exceptionally good.

There has been no epidemic of any importance, with probably the exception of measles, which was somewhat severe in one or two localities; some of the cases proved fatal. We had five cases of typhoid fever in the municipality this fall, all being imported cases, that is, none of the cases were developed in the township. One case was fatal, but the patient had a heart complication, which we believe was the immediate cause of death. There were three or four cases of a mild form of diphtheria, but the disease was stamped out before it had assumed anything like a malignant type. The cases were due to foul cellars and defective drainage. The only or principal causes of death were old age and inflammation.

JOHN G. MENNIE, M.D.,
Medical Health Officer.

GEORGINA.

Secretary's Report.

I beg to present my report of the proceedings of the Township Board of Health for the year now drawing to a close. In the commencement of the year the Board had no occasion to meet or even organize until the 11th August, when the first meeting was held, complaint having been made that a butcher was slaughtering animals in the Village of Sutton. The Board examined the premises and ordered such practice to be discontinued. The Secretary was given instructions to prepare public notices containing the requirements of the Public Health Act, and have them posted throughout the township.

The Board did not meet again until the 19th October, when the smallpox broke out in North Gwillimbury, the adjoining municipality, at which meeting it was decided to notify the trustees of the respective school sections in the township as set forth in section 16, chapter 206, R.S.O.

At a meeting held on the 22nd October the Municipal Council was requested to appoint two Sanitary Inspectors, and to proclaim by posters that all inhabitants of the municipality be vaccinated, in accordance with section 15, chapter 206, R.S.O. Posters were also put up warning persons who had access to smallpox from mingling with the general public; and all churches, schools and societies were ordered to be closed. The Sanitary Inspectors were ordered to keep a vigilant watch at Sutton and Baldwin, two leading thoroughfares from North Gwillimbury to this municipality, in order to prevent

the importation of the disease if possible ; and the houses of William Draper, who had contracted the smallpox in North Gwillimbury, together with two other families who were known to have been visiting where the smallpox was, were quarantined.

The Board met again on the 2nd November, and the Chairman was authorized to arrange with the Reeve of East Gwillimbury for the erection of a suitable place for the shelter of the families in both municipalities affected with smallpox, while their houses were being disinfected.

The Board decreed that in the event of no new cases of smallpox breaking out that the schools, churches and societies be re-opened on the 9th November, 1888.

Another meeting was held on the 19th November, when a complaint was received in reference to a "well" on the premises of Wyndham Shirr, Udora. The Board appointed the Secretary to investigate in reference thereto, and, if necessary, to condemn the same. The house of William Draper was ordered to be thoroughly disinfected. Two cases of typhoid fever were reported in the Village of Sutton.

The Board met again on the 26th November, when the Secretary reported that the water in the "well" of Wyndham Shirr, at Udora, was unfit for domestic use ; consequently it was condemned. The Medical Health Officer was instructed to see that the Act was carried out in regard to the two cases of typhoid fever in Sutton.

A case of diphtheria was reported in the month of October ; the premises were ordered to be placarded, and, the Medical Health Officer being the attending physician, the person recovered. The house was thoroughly disinfected, and the other members of the family escaped the disease.

With the exception of the foregoing the Township of Georgina has enjoyed a blessed immunity from contagious diseases during the year. The Board has endeavoured by every means in its power to check the spread of smallpox that prevailed so extensively in the adjoining municipality, more particularly the Chairman of the Board, Mr. Anderson, Reeve of this Township, who was very zealous and energetic during the excitement that prevailed on that occasion.

ANGUS EGO,
Secretary.

GLANFORD.

Secretary's Report.

The first meeting of the Board of Health for the Township of Glanford, after their reappointment by the Council, was held on the 30th January. All the members being present and being duly organized, expressed a willingness to fill the office to which they were appointed. I have the pleasure of informing you that the Board have not been required to take action in many cases of contagious disease, with the exception of one house, where diphtheria has made its appearance, and one case of typhoid fever. In the cases of diphtheria one proved fatal, but as Dr. A. Farewell, Medical Health Officer for this Township, attended those cases, he used every means necessary to prevent their spread. From the healthy state of the Township and the absence of complaints or the knowledge of any existing nuisance requiring the action of the Board or the services of the Sanitary Inspector, it has not been necessary for the Board to hold any subsequent meeting. As to milk vendors, there are quite a number of them residing in this municipality, none of whom have applied for permits to this Board, but as they all, without exception, sell their milk in Hamilton, I suppose they obtain permits from there. I am pleased to state that the sanitary condition of the township is still good, and the death-rate during the year has been rather below the average of past years.

THOMAS CHOATE,
Secretary.

GLENELG.

Secretary's Report.

I have the honour to report that the general sanitary condition of this Township during the current year has been exceptionally good. Diphtheria broke out in two families, but as the householders and the physicians in attendance failed to report to the Board, no steps were taken by it to isolate the cases or trace the cause. The disease, however, appears to have been confined to the two families, in one of which only one member was affected, and the disease is now entirely stamped out without any fatality.

It is very gratifying to report that with the exception of the above cases no other infectious or contagious disease existed in the Township during the year, and this immunity can in all probability be attributed to several causes: the absence of slaughter houses, tanneries, stagnant mill ponds and other disease-generating centres; the plentiful supply of pure, wholesome water in all parts of the township, and the general cleanliness of the people.

J. S. BLACK,
Secretary.

GLOUCESTER.

Secretary's Report.

On behalf of the Local Board for Gloucester Township, I beg leave to report as follows:—The sanitary condition of this Township for the year 1888, so far as the same relates to the general health of the inhabitants, has been satisfactory; no epidemic, contagious or malarial diseases are known to have existed, with the exception of a few isolated cases of diphtheria and fever, for the origin of which we can assign no other reason than some domestic irregularity or constitutional predisposition.

During the year our Sanitary Inspector has carefully inspected every part of the premises of twenty-five persons engaged in keeping cows for the sale of milk, and found nothing objectionable except in two cases, which were removed. He has also been called upon to look after and cause to be abated eighteen cases of distinct nuisances existing either on the premises of the individuals or on the public highway; all were satisfactorily disposed of with the exception of one, in which the Magistrate imposed a fine of \$5 with costs of the trial.

C. BILLINGS,
Secretary.

GOSFIELD, NORTH.

Chairman's Report.

I have the pleasure to report that during the last year the Township of Gosfield North has been remarkably free from contagious diseases, only four cases of malarial fever having been reported to the Board, and only one of a severe type that resulted fatally. In the spring there were a number of cases of measles confined to a small circle and without any fatal results.

The Inspector reports that he has had great difficulty in enforcing cleanliness in tenements and other rented houses, in consequence of the vagueness of the law as to who are the responsible parties in regard to back-houses, the owner or the tenant.

THOMAS McCREERY,
Chairman.

GOSFIELD, SOUTH.

Medical Health Officer's Report.

In accordance with the requirements of the Public Health Act, I herewith present my annual report for the year 1888.

In consequence of the recent formation of the municipality, and the fact that all of the members of your Board are new to their position, and therefore comparatively unacquainted with their duties in detail, the work of your body has not been characterized by that degree of thoroughness which should and undoubtedly will mark its future actions. I have, however, to compliment you upon your zeal and evident desire to make your organization meet and carry out all the objects for which it is instituted.

Regarding the sanitary condition of the township during the past year, I am gratified at being able to report that, with the exception of a few cases of scarlet fever and a light visitation of diphtheria, it has been exceptionally favourable.

S. A. KING, M.D.,
Medical Health Officer.

GREY.

Secretary's Report.

In presenting to you the annual report of the Local Board of Health of the Township of Grey, it affords me much pleasure to be able to state that the general health of the township for the past year has been good, with the exception of four cases of diphtheria in one family, in the southern part of the township, three of which proved fatal. There has been no other disease of a serious nature reported and the municipality is believed to be in an excellent sanitary condition.

WM. SPENCE,
Secretary.

GRIMSBY, SOUTH.

Medical Health Officer's Report.

During this year there has been a great number of cases of whooping cough, but there has been nothing done to check its spread by the Board and not much by private individuals. They say "it is six weeks coming, six weeks bad, and six weeks going" and thus they let them whoop.

There were cases of scarlet fever reported in three houses; none of these houses were placarded as far as I am aware, but fortunately none proved fatal. Instructions from medical attendants and the strong law of self preservation, were all the protection the public had.

Diphtheria was reported in some cases. The Medical Health Officer was instructed to placard the house of one, which was at a distance of six miles. On reaching the house the patient showed no symptoms of diphtheria, unless it was a piece of red flannel about the neck.

Attending physician notified Secretary by postcard weewkly.

We would recommend that in rural districts, those persons now responsible for reporting contagious diseases (attending physician and householders), be made responsible for the placarding infected houses, and that such cards be furnished to medical practitioners same as the notices of contagious diseases are now.

D. McMURCHIE, M.D.,
Medical Health Officer.

 GWILLIMBURY, EAST.
Medical Health Officer's Report.

In accordance with the requirements of the statute regarding the public health, I submit the following report for the year 1888.

During the first half of the year the measles became very prevalent nearly all over the township, attacking both children and adults, a number of cases being quite severe and requiring medical attendance. Throughout the year there was also a number of cases of diphtheria, typhoid fever, malarial fever and scarlet fever. The general means of disinfection were observed, and none of these diseases spread to an alarming extent.

In October a case of smallpox was reported in the extreme north-eastern corner of the township. The disease was contracted in the adjoining township of North Gwillimbury. The Board of Health took immediate action, enforcing the vaccination Act in the northern part of the township to stop the spread of the dread disease from the north, quarantining the afflicted one and also the infected district, and taking every means to limit the disease. Vaccination was common in the greater part of the township. The case made a good recovery and the disease is supposed to be defunct and the township now in a satisfactory condition. All complaints of nuisances were promptly attended to by the Board.

W. ARMSTRONG, M.D.,
Medical Health Officer.

 GWILLIMBURY, NORTH.
Medical Health Officer's Report.

I have the honour to make the following report as Medical Health Officer for the township of North Gwillimbury.

Our township has been visited with an epidemic of smallpox, beginning on the 10th October. The origin of the epidemic was from a young man, Sprague, North Gwillimbury, who had attended the Toronto Exposition. The disease was diagnosed on the 10th of October, but in the meantime a number of people had come in contact with the affected person. The fact that smallpox existed in rural townships necessarily created a good deal of disturbance in the community. At a joint meeting of the two Boards vigorous steps were taken for the suppression of the disease. I would here congratulate the Reeves of the respective townships for their untiring efforts in assisting their respective Boards of Health in getting the disease under control. I also thank them for individual assistance rendered to myself.

There were seventeen cases of the disease in all, and only one death.

We have fortunately had only one death, an infant, from the disease, and writing at this date I can reasonably expect that the danger is past.

In communities of so great an extent, difficulty is experienced in carrying out the means of protection. Both townships passed the compulsory Vaccination Act, and that has been carried out as far as practicable. It is true that we have had to contend with some persons so headstrong that they would not submit to vaccination, but on the whole I have to congratulate the people on their willingness to uphold the law, and do what we judge best for themselves and families.

My sincere thanks are due to Drs. Bryce and Lehman for valuable advice, as also to my assistant vaccinators for the efficacy of their work.

I have also to report two cases of typhoid fever in the township of Georgina, and one case of diphtheria. All these cases were under my personal supervision and no new cases of either disease have since developed.

Dr. Pringle, a co-practitioner in this district, has also been active in assisting with the vaccination of the people.

I think the people are to be congratulated in the rapid stamping out from the community of such a contagious disease as smallpox, and to the Boards of Health, with the addition of the gentlemen above named, I feel myself much indebted for so satisfactory a result.

T. B. BENTLY, M.B.,
Medical Health Officer.

HALDIMAND.

Medical Health Officer's Report.

I beg to submit the annual report on the sanitary condition of this township for the past year.

The type of contagious diseases which have been most prevalent in years past, viz. typhoid, malarial fevers and diphtheria, have in a very much milder form prevailed in some localities during the past year.

In the neighbourhood of Grafton there have been several cases of typhoid fever malarial fever and diphtheria, the causes of which were discovered and remedied.

Malaria still abounds in the locality of Grafton Grand Trunk Station. Although much improvement has been made in the way of elevating the road and some parts of the station yard, much yet remains to be done; and to perfect what has been only commenced, it will be necessary for this Board to prevail on the Grand Trunk corporation to make still further improvements.

From far-off parts of this municipality came occasional reports of contagious and infectious disease, but owing to the Health Act being improperly carried out no official report has been received.

I have to report the same complaint as in years before, that reports of diseases required by the Health Act in distant parts of this township are not made; and before this Board can obtain accurate reports of sanitary conditions, or before the annual report is as the Act requires, some means must be adopted to obtain official and true information.

I trust at the ensuing annual meeting this matter will receive your serious consideration.

W. W. BOYCE, M.D.,
Medical Health Officer.

HARVEY

Secretary's Report.

I have to report two cases of diphtheria in Harvey township during the present year; both of the patients recovered. One was sick sixty days and the other fourteen days, as reported to me by our Medical Health Officer, Wm. McCamus, M.D., of Bobcaygeon.

I am glad to have it to report that we are free from all contagious diseases, and that the general health of the inhabitants is good.

JAS. S. CAIRNDUFF,
Secretary.

HAWKESBURY, EAST.

Chairman's Report.

The Local Board of Health of the township of East Hawkesbury was organized in 1885, and for three years there was a good deal of diphtheria and scarlet fever, but for the last twelve months the township has been free from these diseases.

There still exists a pretty strong opposition to the working of the Board, notably by owners of cheese factories ; and, also, the trustees of the common schools do not all try to keep the water closets as clean as they ought to be, and in some cases have none on their premises.

In 1888 the Local Board of Health held three public meetings at different places and on different dates, and had the Act on Public Health explained in both English and French, and found it to have its effect for good when the people understood the intention.

ROBERT LEE,
Chairman.

HAWKESBURY, WEST.

Medical Health Officer's Report.

This municipality was entirely free from contagious diseases till the latter part of the summer. During the hot weather the sickness among children was less than usual, and the type of sickness was such as to render the disease more easily controlled. After the wet weather began typhoid fever and diphtheria made their appearance together, with quite a number of cases of pneumonia, bronchitis and other lung troubles. There have been seven cases of diphtheria, eight of typhoid fever and no deaths.

The Sanitary Inspector reports that the township is in a very fair sanitary condition. He says, however, and I agree with him, that the village cannot be kept in a sanitary state so long as the present imperfect system of drainage is continued.

D. J. McINTOSH, M.D.,
Medical Health Officer.

HAY.

Secretary's Report.

In compliance with the provisions of the Health Act the township council appointed a full Board of Health at its first meeting. The Board considered it necessary to call one meeting only, early in the spring. A complaint had been made that a pond of stagnant water adjoining the schoolhouse grounds in the village of Zurich, might become the source of disease ; also, that an open drain in the same village containing filth and stagnant water, was detrimental to the public health. The Board acted promptly in the premises and caused the nuisances to be abated.

The work of the Sanitary Inspector consisted in causing the removal of two pig-pens in the village of Zurich, and preventing the accumulation of manure heaps owned by two different parties in the same village, and inspecting and causing a tannery and slaughter-house to be kept purified and cleanly. He also examined the grounds and water closets in some of the school sections of the township and had the same cleansed wherever it was found necessary.

The general health of the people of the township has been very good during the year. There has been two outbreaks of scarlet-rash with no reported fatal results. A few cases of diphtheria occurred during the spring and fall. All recovered so far as is known. Three cases of typhoid fever were reported, and a number came under my own observation that were not reported by medical men. Of the three reported two proved fatal—both being brought home sick with the disease from outside municipalities, but through the skill of the physicians the disease was prevented from spreading.

S. FOSTER,
Secretary.

HIBBERT.

Secretary's Report.

The Local Board of Health for the township of Hibbert had no occasion to display any extraordinary activity during the present year, because there was nothing unusual in the general condition of the health of the people to justify it. No reports have reached me of any infectious or contagious disease breaking out in the municipality, except one case of typhoid fever and that an imported one, which was not accompanied by any bad results. The Local Board of Health took no steps towards enforcing a general system of vaccination, seeing that there was no apparent cause for immediate action, and to avoid the expense which such a course would entail on the township. Dr. A. McTavish, Medical Health Officer, has, I regret to say, become an invalid; and as he had given up the practice of his profession and moved away from the municipality, I fear he will not be able to make any report.

J. CARROLL,
Secretary.

HILLIER.

Medical Health Officer's Report.

I beg to report six cases of diphtheria during the year occurring in the township, which were reported to me by their medical attendants, with three recoveries and three deaths, all of which were quarantined, and after recovery or otherwise buildings and clothing thoroughly disinfected. The only nuisance brought under my notice was a slaughter-house in Consecon. I visited and examined it thoroughly on July 4, 1888, and found building in a clean condition; but occupant had moved apparatus the night previous. It was situated too near the street and too close to dwellings, contrary to law. On the first of October I was notified that Joseph Hays was slaughtering on said premises. I ordered him to cease doing so or I should be compelled to take action in the matter. I have not had any complaint relative to it since.

J. B. RUTTAN, M.D.,
Medical Health Officer.

HINCHINBROOKE.

Secretary's Report.

I am happy to inform you that the Board of Health of the township of Hinchinbrooke has not met this season so far, there being no necessity for it. The township seems to be in a perfectly healthy state. There have been no contagious nor other diseases reported. There has been no sickness to speak of, and there have been but two deaths, and those from old age and old standing complaints. The Board of Health has had no interview with their Medical Health Officer; consequently he has no report to make. I write from my own knowledge of the state of the health of the community, and if the Board was in session they would adopt it. Hoping it will meet with your approval,

JOHN HAMILTON,
Secretary.

HOPE.

Secretary's Report.

I have much pleasure in stating that during the year there has been no epidemic of a serious character within the municipality.

There have been a few cases of diphtheria, two resulting fatally ; but upon strict quarantine measures being enforced by isolating the families afflicted, and a liberal use of proper disinfectants, the disease has in each case been confined to the parties originally attacked.

Complaints have been made to the Board of Port Hope of parties dumping garbage and other refuse matter upon the lake shore, east of the town, which in hot weather decomposes and exhales noxious gases, poisoning the atmosphere and making it at times unbearable to residents of that vicinity.

Printed notices were posted prohibiting all kinds of refuse matter from being deposited on the beach, and as a result the nuisance has been somewhat abated. Other and more effective measures may be required in order to put a full stop to the pollution of this neighbourhood.

The several slaughter-houses and cheese-factories situated within the municipality have been inspected periodically by the Inspector, and found to be kept in good sanitary condition.

It has not been considered necessary to enforce the law respecting the inspection of the premises of vendors of milk, no complaints having been made to the Board as to the condition of the byres or to the quality of the milk sold.

In conclusion I would suggest that the duties of the Sanitary Inspector be extended to the inspection of public school premises, as complaints have been made of the unsanitary condition of the same ; also, that cards be printed for the use of the Medical Health Officer, in order that infected houses and districts may be properly placarded.

E. E. DODDS,
Secretary.

HOUGHTON.

Secretary's Report.

In reporting on the sanitary condition of this municipality, and the work of the Local Board of Health during the past year, I am sorry that I cannot, as in former years, report immunity from contagious and infectious diseases. There have been fifteen cases of diphtheria reported, of which number seven proved fatal. The proportion of the cases terminating fatally shows the disease to have been of a virulent type. There were three outbreaks of the disease in as many localities, sufficiently distant from each other that there is no probability of any connection between them. From the most reliable information obtained as to the causes of these outbreaks, it is almost certain they were not caused by anything existent within the municipality. The first affected in each family had contracted the disease from patients suffering in other municipalities, others from persons who had been away and returned home, being afflicted therewith on their return. The Board, when aware of these outbreaks, took such steps as were deemed best calculated to prevent the spread of the disease. Schools were for a time closed, isolation effected, and fumigation and disinfection employed. No Health Officer had been appointed, the duties of that office having been intrusted to the member of the Board residing nearest the afflicted localities. At the last meeting of the Board there was not a case of diphtheria known to exist in the municipality, and none have since been reported to the secretary.

GEORGE BUNDY,
Secretary.

 HOWE ISLAND.
Secretary's Report.

I have to inform you that this township was free from sickness of any kind for the current year, except one case of typhoid fever which resulted in death. It was contracted in Kingston where the young man worked, but he died in this township where his parents lived.

The Medical Health Officer lives in Gananoque; he was not called on the present year, so I think he would have no report to make.

Take it all through, this is a healthy part of Ontario.

M. MELVILLE,
Secretary.

 HULLETT.
Secretary's Report.

I have the honour to report that the sanitary condition of the municipality of the Township of Hullett has been very carefully watched during the past year by our Local Board of Health and its officers.

Provision was made in the early part of the year for inspecting the cheese-factories, slaughter-houses and other industries in the township, according to law, which was done. No reports of nuisances, infectious or contagious diseases were reported to the Board during the year.

We had a few cases of typhoid, and one case of diphtheria ended fatally.

JAMES BRAITHWAITE,
Secretary.

 HUMBERSTONE.
Medical Health Officer's Report.

I beg to submit to the Board the following report upon sanitary points coming under my notice during the year. Sanitary duties this year seem to have been well recognized by those officially interested. The Sanitary Inspector has been reasonably active in looking up and abating nuisances, such as uncared-for piggeries, slaughter-house sources of infection, and correcting in places pernicious water-closet arrangements, which would have, if left alone, produced some form of zymotic disease.

My attention was called during the early part of the past spring to a diseased specimen of pork. The hog had been slaughtered by its owner in an adjacent municipality; its carcase carried and delivered to the purchaser, living in Humberstone, who paid for it; but finding its kidneys had been affected by abscess I ordered it to be buried. My action was sustained by the justices before whom action was taken by the purchaser to recover his money. I have had some few cases of infectious diseases reported to me in the past few months—one case of scarlatina, by Dr. J. B. Neff. The house was duly placarded, isolation and disinfection adopted, and the case recovered; the disease did not spread. I had a similar case of my own—the management and result similar. Several cases of scarlet fever were reported to me by Dr. N. Brewster, of Ridgeway, Bertie; they were the children of Frank Near, of this township. The cases presented a mild form of the disease.

There was only one case of typhoid came under my notice. I took personal supervision of all cases of an unsanitary condition, and had them satisfactorily remedied.

Owing to the smallpox in Buffalo our council ordered a general vaccination in the township, and I vaccinated, up to the present, nearly two hundred persons.

I have visited some of the school sections, where I have vaccinated quite a number—some accepted vaccination kindly, others otherwise; one trusty corporation official advised me not to go to the school house. If the vaccinations had been free of charge, I would have done more of them, and even when I have tried to get the fees, I have only succeeded partially.

M. F. HANEY, M.D.,
Medical Health Officer.

HURON.

Chairman's Report.

The Board appointed Francis Shannon, of Ripley, Sanitary Inspector. He visited all the houses and premises in the village of Ripley and several other places in the township, and reported all in a good sanitary condition, with one or two exceptions, which were promptly attended to. There is a system of dry-earth closets in the village. The health of the township has been good during the year, only two cases of diphtheria having been reported, which the Medical Health Officer attended to.

WILLIAM WILSON,
Chairman.

INNISFIL.

Medical Health Officer's Report.

I beg to report that during the year there has been no more than the usual amount of sickness in this municipality. A few cases of diphtheria existed during the month of November in the south end of the township; but, apart from this, we have, I am thankful to say, been remarkably free from contagious diseases. The existence of smallpox in the adjoining township of North Gwillimbury gave cause for considerable alarm; but the measures adopted by the Board, although not so stringent as they perhaps might have been, prevented its introduction into our midst. I have recently vaccinated a large number of persons, principally children; still, I have found a great many, in some cases whole families, who decline to take advantage of this protection, and until your Board decides to make vaccination compulsory, it will never be properly and thoroughly attended to. This neglect on the part of heads of families does not arise from any objection to the operation, but from sheer carelessness, and from the idea that it will be time enough to attend to it when the smallpox is in the next house.

THOMAS BRUNSKILL, M.D.,
Medical Health Officer.

KEEWATIN.

Secretary's Report.

In presenting to you the report of the Local Board of Health for the Township of Keewatin for the year 1888, I have to state that the health record for the township has been remarkably good. The rules for cleanliness have been well observed, and there was no necessity for the council to appoint a medical health officer or sanitary inspector. The removal of a few nuisances was the only work requiring the attention of the Board.

There has not been any contagious disease. This locality is favourably known as a health resort.

T. A. WILSON,
Secretary.

 KEPPEL.

Secretary's Report.

In accordance with statute I beg leave to submit my report for the past year. I have much pleasure in stating that the general health of the township has been very good, only one case of contagious or infectious diseases having been reported to me, it being a case of scarlet fever in a very light form, and was confined to one person. The death-rate of the township has also been very low, the total number of deaths being 33, caused by old age, etc. The members of the Board have had very little trouble with unsanitary conditions. There was only one complaint of a nuisance during the year.

GEORGE ATHEY,
Secretary.

KINCARDINE.

Medical Health Officer's Report.

I have the honour of submitting my annual report as Medical Health Officer. It affords me pleasure to be able to say that the health of the people of the township has been as usual very good. We have been free from diphtheria, scarlet fever, and all particularly contagious or infectious diseases due to a want of sanitary precautions in many cases. True, we have had a case or two of typhoid fever, none of which proved fatal; but the cases have been of a mild character, and not traceable to any cause requiring attention from the Board of Health. Complaints to the Board during the year have been few, and these have been attended to.

THOMAS BRADLEY, M.D.,
Medical Health Officer.

KINLOSS.

Medical Health Officer's Report.

In submitting this my second annual report for the township of Kinloss, it affords me pleasure to congratulate you on the almost entire absence of any of the zymotic or infectious and contagious diseases within your township during the year now ending. Early in the summer my attention was called to a severe case of diphtheria on the 12th concession, but by insisting on complete isolation and allowing no intercourse with any of the neighbors, we succeeded in confining it to the one house. I have again to call your attention to the very unsatisfactory sanitary condition of many of the school houses and grounds, and would recommend a thorough inspection with a view to a better system of ventilation. To the want of proper ventilation in our schools is to be attributed the cause of a great many of the minor complaints, particularly headache so frequent among school children.

Trusting, for the sake of little sufferers, that you will give this matter your most serious attention, and enter into it with that energy which has hitherto characterized the Kinloss Board of Health.

JNO. S. TENNANT, M.D.,
Medical Health Officer.

LAXTON, DIGBY AND LONGFORD.

Secretary's Report.

I beg to present my annual report of the health of this municipality for the past year.

I am happy to say that our municipality has been free from any contagious disease for the last year. There were a few cases of measles in the beginning of the year, and the Board dealt with the disease according to the Health Act. The children of the school section were ordered to stay away from school until they were better. There were no deaths. I have heard of nothing since. The Board has no medical health officer, as the municipality is free from disease.

WILLIAM MAXWELL,
Secretary.

LOBO.

Secretary's Report.

The Secretary of the Board, in compliance with the requirements of the Public Health Act of 1884, begs to report as follows:—

The Municipal Council of the township of Lobo at their first meeting in January this year appointed a Local Board of Health. The Board met, organized and appointed Robert Boston chairman.

P. L. Graham, M.D., was appointed to see that all the school houses in the township were disinfected, and that all the wells and outbuildings were in a proper condition. The Medical Health Officer was instructed to procure all necessaries for the Alway family, who were sick with diphtheria. Under his charge diphtheria was confined to this one house. Two persons died. One of the attendants on the family took the disease while there, and was kept there till better. The premises were disinfected as soon as the inmates were better.

The Board attended to all matters that came under their notice. The general sanitary condition of the township is very good.

E. R. BARCLAY,
Secretary.

LONDON.

Medical Health Officer's Report.

In submitting this report I do so under difficulties, as many of our practitioners have not reported the cases of contagious disease as required by law, and therefore a full report is impossible.

During the past year I visited the cheese-factories in this district, and found some of them in a very unsanitary condition. I ordered them to be properly cleansed and disinfected according to the report formerly sent in by me.

Since my last report I have attended eleven cases of diphtheria and one of typhoid fever, none of which have died; and there have been reported to me twenty-one cases of diphtheria, of which six died, one case of typhoid which recovered, and two of scarlet fever which recovered. At present I am not aware that there are any cases of scarlet fever in the district, though there may be some that have not been reported.

During the past year the township has not been in a healthy condition until the last few months, during which there has not been so much sickness, though there is considerable even now.

GEO. SHOULTS, M.D.,
Medical Officer.

LUTHER, EAST.

Medical Health Officer's Report.

I have the honour of submitting my report as Medical Health Officer for East Luther. I am glad to say we have been tolerably free from contagious diseases. I have had no reports of typhoid cases, and only one of diphtheria brought to my notice, which terminated favourably. There were two cases also of scarlet fever reported in the spring. The Board had some trouble from a nuisance caused by a resident of the village depositing night soil on his garden, and took steps to punish the offender and abate the nuisance.

The Inspector, at my request, visited on two different occasions the butchers' shops and slaughter-houses, and reported favourably. I had to condemn one dwelling-house (though I believe the residents have not yet removed), where four people were living in one room, at the door of which were three water-closets in constant use. The wife of the occupant was down with sickness, which could not be wondered at. I would call attention to the fact that at the public school no water accommodation is provided unless what is carried there, and would suggest that the Board take steps to have it provided. A new cemetery has been opened this year near the village, but so far has not been inspected or reported on. I believe though from personal observation that it is well situated.

R. R. HOPKINS, M.D.,
Medical Officer.

LUTHER, WEST.

Chairman's Report.

Your Board of Health beg leave to report :—

That after their appointment they met and organized and laid out the township into sections, one section to be under the supervision of a member of the Board, and if any case was brought to his notice he was to report to the Chairman, who would call a meeting of the Board to take such steps as were necessary, and we are happy to say that there was not a single case brought to our notice.

In the early part of the year there were two isolated cases of diphtheria, both of which proved fatal, but the disease was stamped out and did not spread.

That so far as known to us there is no infectious or contagious diseases in the township, and the general health at the present time is good.

JAMES ISLES,
Chairman.

MAIDSTONE.

Medical Health Officer's Report.

I am again pleased to be able to say that we have escaped this year from any contagious disease of sufficient prevalence to be called epidemic. There have been two slight outbreaks of that dread disease, diphtheria, which still seems to linger in some sections all over North America. In neither of the outbreaks did the disease spread. We have had some measles and croup. There has been this year a greater prevalence of typhoid than usual, though I have heard of only one death from it.

I would urge the Board to persevere in their efforts to have each family in the municipality clean thoroughly, at least once a year (in the spring preferred), their respective wells.

The importance of this, and also the drainage of door-yards and barnyards cannot be overestimated in its effects on diminishing zymotic diseases.

Owing to the existence of smallpox in at least two points in Ontario, it may become a question with the Board to have a general vaccination performed throughout the township.

S. RICHARDSON, M.D.,
Medical Health Officer.

MANVERS.

Medical Health Officer's Report.

I have to report that during the past year an epidemic of measles prevailed through the township, but as the type was not malignant in its nature very few fatal cases occurred. A few isolated cases of scarlet fever and diphtheria occurred, but by the judicious management of the physicians in attendance, and the observance of the sanitary laws by the families where the cases existed, the contagion was kept from spreading, and to-day I am not aware of a case in the township.

About half a dozen cases of typhoid fever occurred in Janetville and vicinity, one ending fatally. The fever was caused by a dry mill pond, the water having been let off for repairs, the old rotten logs and sawdust giving rise to the poison which caused the fever, and at one time there was grave reasons for suspecting a general outbreak; but by the advice of Dr. Allan, myself and others, the repairs were hurriedly completed and the water raised, and since the disease has about ended. I believe only one case has occurred since. I am pleased to notice that in the rural parts more attention is paid to sanitary laws than formerly.

T. G. BRERETON, M.D.,
Medical Health Officer.

MARIPOSA.

Secretary's Report.

The Local Board of Health of the Township of Mariposa would respectfully report as follows:—

Our Board was duly organized and held its first meeting in February, 1888.

We have not experienced any trouble in carrying out the provisions of the Public Health Act, as the residents of the township have shewn a willingness to carry out the recommendations of our Sanitary Inspector.

The report of the Inspector shews that he has made since our last report 100 domiciliary visits, carefully examining cellars, wells and privies, and in all cases where he found it necessary gave instructions to have cellars, wells and privies cleaned out, and in some cases to have the privies filled up, which instructions were generally promptly carried out.

He also inspected each of our public schools twice during the year, and carefully examined the wells and water-closets in connection with them.

The several physicians practising within our municipality were furnished with a supply of blank forms for reporting cases of contagious diseases, and were also written to by the Secretary urging them not to fail in making such returns to the Board.

I have had reported from the medical practitioners since my last report nine cases of diphtheria, two proving fatal; two cases of scarlet fever, recovered; five cases of measles, recovered, and three cases of typhoid fever, recovered.

In the cases of diphtheria, as soon as I received notice of the same, I had the house placarded and the disease did not spread.

We consider that our municipality, numbering over 4,000 inhabitants, is in a fair sanitary condition, and certainly in our villages much better than before the formation of the Health Board. The general health of the people is good, and we have no hesitation in reporting that our people are becoming more interested in sanitary matters.

JOHN F. CUNNING, Secretary.

MARKHAM.

Medical Health Officer's Report.

In compliance with the Public Health Act I beg to submit my report for 1888 :—

I regret to say that the medical men practising in Markham Township, as a rule, do not report cases of a contagious nature. I cannot make a tabulated report, as my information is considerably heresay. There have been a number of cases of whooping cough and typhoid fever, a few cases of scarlet fever and a great many cases of diphtheria, with a large percentage fatal. The cases that were reported to me I attended to, placarding, disinfecting, etc., to prevent spreading to other families if possible. By far the greatest number of cases of diphtheria were in the 2nd and 3rd concessions, but there were cases scattered over the whole of the township. There was a family near Stouffville exposed to smallpox, which, by direction of Dr. Bryce, I quarantined.

At the present time (December) the township is quite free from contagious diseases.

G. M. FARWELL, M.D.,
Medical Health Officer.

MARYBOROUGH.

Medical Health Officer's Report.

During the year I have inspected a number of places which I expected were in an unhealthy condition, but in only two instances found them so. The cause was at once removed.

Contagious diseases were very few there, having been reported only five typhoid fever cases, with four recoveries and one death. There was only one case of diphtheria, with recovery of the same.

The people of Maryborough have reason to congratulate the Board for the manner in which they have acted during the season.

C. W. HUNT, M.D.,
Medical Health Officer.

MELANCTHON.

Secretary's Report.

The Board of Health for the Township of Melancthon beg leave to report that the general health of the township for the past year has been good, the death-rate being considerably less than last year. Last September a family living in the City of Toronto had a very malignant type of diphtheria. Members of the family who had not taken it were sent by railway to their friends in this township, without their friends knowing of the disease, and the children sent up mingled freely with the children of this neighbourhood. As a result five cases of a most malignant character of diphtheria broke out, and not until thirteen cases had broken out and five deaths took place could it be brought under

control. It was fortunate that the cases as they occurred were isolated at once. If it had happened in a more thickly populated part of the township, the result would have been very serious.

Had the family referred to been properly isolated and quarantined by the health authorities of the City of Toronto, we would not have had the disease and the loss of valuable lives therefrom in our township. We may therefore thank those self-eulogized and badly-named sanitarians of Toronto's Local Board for all the trouble.

JAMES BROWN,
Secretary.

METCALFE.

Medical Health Officer's Report.

I have much pleasure in submitting to you my annual report for the Township of Metcalfe for the year 1888.

I find a very great deal of difficulty in giving an accurate report of the contagious diseases that have been most prevalent in the township, owing, I think, to the want of attention paid by practitioners to the reporting of cases.

The general health of the municipality has been good, with the exception of a few cases of diphtheria of a very mild form; none fatal.

In regard to the sanitary condition, the Sanitary Inspector made an inspection last spring, and attended to all the complaints during the summer.

A. NIXON, M.D.,
Medical Health Officer.

MIDDLETON.

Medical Health Officer's Report.

I beg to submit to you for your consideration my annual report of the sanitary condition of this municipality and the public health of its residents, as required of me by the statutes of Ontario. During the year past there has been a comparative freedom from all diseases of a contagious nature, and the public health has been fully up to the average. With the exception of a few slight outbreaks of diphtheria in the eastern and western portions of the township, very little disease of an epidemic character has visited us. The total number of cases of diphtheria would probably number about twenty-five or thirty, whilst the number of deaths from this disease was three in the eastern and probably an equal number in the western division. The causes leading to these outbreaks are unknown. In one single instance it arose from an imported case, and in all others no direct cause could be found, excepting a want of sufficient care in improving the sanitary conditions of the premises. In one instance the residence, a log-house, was built on the ground—no air allowed to circulate underneath the dwelling—insufficient light given by means of windows, thus causing a dampness of its walls within.

A marked improvement in the treatment and general supervision of diphtheria patients has also been visible. In every instance they were confined to a single house, and all intercourse between the dwelling and the public cut off, so that in no single instance, to my knowledge, did the disease spread to a second family or individuals other than the ones first affected. The custom formerly adopted of holding public funerals has also been abolished, and now when deaths have occurred, the remains have been almost immediately interred by members of the family or other persons not liable to become infected. Thorough ventilation and disinfection of houses has also added much to the freedom from this disease.

Measles and scarlet fever have been unknown in this district during the year. Varicella was prevalent, with no deaths.

During the autumn months a number of cases of typho-malarial fever occurred in the central and western divisions of the township, and several deaths occurred from this cause. For the most part these cases were found in low districts, where the land was new and much of the soil broken up for the first time. In at least one family the disease may be attributed to the water used for domestic purposes. In this instance a well had recently been dug near the corner of the house, where for years previous to this water and filth from the kitchen had been poured out and allowed to penetrate the soil, thus finding their way into the newly erected well.

Your Board of Health have done the township good service. During the early part of the year it became evident that the burying grounds lying adjacent to and in the village of Delhi, would become a nuisance if further burials in them were allowed. Your Board of Health held a meeting and very wisely decided to prohibit parties from burying in the same. This order has been enforced and a new cemetery has been purchased outside of the village, and many bodies transferred from the old cemeteries.

A second meeting was called in November to take into consideration the matter of compulsory vaccination. Not deeming it necessary that it should be made compulsory, they appointed a Medical Health Officer for the township, and gave notice through the newspapers of such appointment, that all who chose to do so might avail themselves of the opportunity to be vaccinated; and also provided for free vaccination of all persons not able to pay the necessary fee for the same.

On the whole I consider the sanitary condition of the township to be very satisfactory, and the general health of the people a matter for congratulation of the persons having charge of the same.

J. F. HOUSBERGER, M.D.,
Medical Health Officer.

MONO.

Secretary's Report.

I beg to submit to you the annual report of the Board of Health for the year 1888. There have been no contagious diseases reported.* There were some cases of supposed diphtheria; if they were of the real type they were exceedingly mild in their nature. No deaths occurred. Our Council has not appointed a Medical Health Officer; they considered that it was not necessary.

ANDREW HENRY,
Secretary.

MOORE.

Medical Health Officer's Report.

I beg to submit the following report for the township of Moore:

Nothing of importance occurred until the 9th of November, when the Board organized in response to a report of Dr. Ames, of Brigden, that a case of smallpox existed in an Indian camp, on a bush farm five miles from a village and a safe distance from any dwelling. The patient was at once isolated, the rest vaccinated successfully, and a strict quarantine established. Three weeks from the appearance of the rash, the cook, a

* If there was no Medical Health Officer to look after those cases, how are we to know whether they were or were not real diphtheria? Mere supposition in cases of contagious diseases is very dangerous. We hope that in future the lives of people will not be endangered by thinking the disease *was not*, when probably it *really was*, diphtheria.--[ED. REPORTS.]

delicate female, took ill with well marked premonitory symptoms of smallpox and died on the fourth day. Every possible precaution will be taken by our Board before releasing them from quarantine. The cause of the outbreak was a visit to Sarnia, where the disease existed, by the Indian first attacked.

The Board ordered all the school children to be vaccinated, which has been done. I was surprised to find that not more than 15 per cent. had been done before.

We received a visit from Dr. Lehman, your Inspector, who approved of all that had been done, and advised compulsory vaccination. Our Council have not taken any action.

On the 17th of November a mild case of varioloid occurred in a farm house, evidently as a result of a visit to Sarnia. As no new cases have developed, we hope the disease is stamped out in this township. Five cases of typhoid fever occurred in the first week of this month, within one mile of each other; cause cannot be traced.

The schools visited in this section have not the first sign of any means of ventilation, and the majority are in a filthy condition. The Local Board and Council are very remiss in their duty if they do not devise some means to remedy this disgraceful condition.

F. B. WILKINSON, M.D.,
Medical Health Officer.

MOSA.

Medical Health Officer's Report.

In compliance with the requirements of the Public Health Act, I have the honour to lay before you my annual report.

I am pleased to be able to report that the sanitary condition of the township is excellent. During the year the township has not been visited by any widespread cause of mortality or sickness beyond the ordinary causes that are at work from year to year, and over which we have no control.

The Board of Health met and organized during the year, and we are prepared to meet any emergency should such arise.

J. WALKER, M.D.,
Medical Health Officer.

MURRAY.

Medical Health Officer's Report.

I have the honour of submitting my annual report as Medical Health Officer of this municipality.

It affords me pleasure to state that the health of the township is good at the present time.

During the past year my attention has been called to several outbreaks of diphtheria, but, by the prompt and efficient action of your Board in regard to disinfection, isolation, etc., the disease has always been confined to the premises, with one exception, and that with fatal results.

During the year we had fifteen cases of diphtheria, one of which died; two cases of typhoid fever and two of scarlet fever, all of which recovered. One family of five were all down with diphtheria at one time, the cause being a filthy condition of the premises, which I am happy to state has been entirely removed. The other cases could not be traced to any local determining cause.

There have been no complaints lodged before me about nuisances of any kind, and I take great pleasure in stating that the township is at present particularly free from all those places which would readily generate disease.

I would ask your attention to the filling up of cesspools, old cellars etc. This has been done in the past with beneficial results. I would further ask your aid in the prevention of the erection of water-closets adjacent to wells, as several cases of sickness have occurred this year under my notice, due to this cause.

W. H. McKAGUE, M.D.,
Medical Health Officer.

McKILLOP.

Medical Health Officer's Report.

I have again the honour of submitting to you the annual report of the sanitary conditions of your municipality.

On May 28th the first meeting of the Board was held. At that meeting remedial steps were taken to remove the only nuisance complained of.

The Board also gave me instructions to have all the children attending the schools in the township vaccinated. I am happy to report that such instructions were carefully carried out.*

During the months of July and August an epidemic of dysentery broke out, and apparently spread over a considerable section of the municipality. It was of a severe type, and attacked alike both old and young, and was the immediate cause of several deaths. However, apart from this disease, your municipality has been fairly healthy, and at the present time I can congratulate you upon its immunity from any infectious disease.

W. HANOVER, M.D.,
Medical Health Officer.

Secretary's Report.

The Board of Health only met twice this year.

The nuisance complained of at the first meeting was a smell arising from a cheese factory and a pig pen in connection therewith. The factory was on one side of the road and the pig pen on the other.

The Board ordered the Medical Health Officer to vaccinate all the children in the various schools at the expense of the municipality, and at the meeting on the 17th Nov., he presented his bill of \$120 for vaccinating 480 children, and \$23.50 for vaccine, from Palmerston Vaccine Farm. The Board of Health gave an order on the Treasurer of the municipality for the amount. Some of the children were vaccinated the second time, and now report has it that there is not over 25 or 30 in the municipality that had the operation successfully performed. In one school, out of 20 vaccinated, only 3 have taken, and the next out of 58 vaccinated, only about 6 have taken. There were no certificates given nor required by the Board of Health. Of course the Board has learned something, but thinks that the knowledge so curiously obtained was dear bought.

JNO. C. MORRISON,
Secretary.

*As will be seen the Medical Health Officer distinctly states in his report that his instructions to vaccinate were *carefully* carried out. We suppose this means that vaccinations were successfully performed. If, however, there were 17 failures out of 20 vaccinations, and 52 out of 58, we fail to see the success of the movement. The Council should employ some person to visit all the schools, to ascertain the real state of matters, and note down the total number operated on and the number showing good marks.—[ED. REPORTS.]

 McNAB.

Secretary's Report.

As required by the 24th section of the Public Health Act of Ontario, I beg leave to report :—

That scarlatina made its appearance in two or three different localities in the township during this year, and as far as known there were only two cases fatal. The physician in attendance did not report to me, but the way I received the information was by the registration of their deaths, and as the inhabitants in the localities where the disease was used every precaution to keep it from spreading, there was no necessity of the Board incurring the expense of enforcing any sanitary measures. I may state that the disease in general was of a very mild type, and was, therefore, not difficult to stamp out.

I am happy to report that our municipality continues to enjoy almost a perfect state of immunity from any kind of epidemic or contagious disease, and my long residence in the township warrants me in stating that unless disease is imported amongst us, no sanitary or other measures are required to be enforced by the Board of Health.

J. D. McNAB,
Secretary.

 NICHOL.

Secretary's Report.

The Local Board of Health has the satisfaction of reporting that during the year now drawing to a close the general health throughout the township has been very good, no epidemic of any kind having been prevalent. Wherever any nuisance was ascertained to exist its immediate removal was attended to.

Dr. Paget, of Elora, was appointed Medical Health Officer and Sanitary Inspector for the municipality for the current year, and he has reported in writing to the Board that according to orders he had visited the House of Industry and found all sanitary arrangements in perfect order, and also the slaughter-house near Fergus in good condition.

JAMES McQUEEN,
Secretary.

 NEFEAN.

Medical Health Officer's Report.

The general sanitary condition of the municipality will be found to compare favourably with the more healthy of those throughout the Province, there being, with the exception of the numerous slaughter-houses and the Holland Farm, no locality from which we might reasonably expect poisonous effluvia to so contaminate the atmosphere as to favour the spread of contagious diseases.

The former, some twenty in number, were personally inspected by me in company with the Local Health Officer, Wm. Gordon, in the month of August last, and found in each case a very satisfactory sanitary condition. Of the latter I have heard no complaints since our unsuccessful attempt to suppress the nuisance last March.

Owing to the fact that the law respecting the registration of contagious diseases has been very much disregarded, it is impossible to give any estimate of the number of such cases during the year.

Of diphtheria, the only contagious disease of which I received any returns, three cases have been so far reported, with a mortality of two.

No cases of typhoid have up to the present been reported, yet I regret that this is no indication of the prevalence of the diseases during the year.

At the request of the Public School Inspector, I inquired into a reported outbreak of scabies among the pupils of School Section No. 5 in September last. A close examination of all the children limited the trouble to three alone, all members of the same family. Exclusion of these from the school until reported free from infection by their attending physician, and a complete and thorough disinfection of the building reduced the danger of transmission to any of the others to a minimum; no more cases have since been reported from that source.

Two nuisances in the way of pig-styes too near dwellings, one in Mount Sherwood and the other in Archville, have been abated.

In conclusion I would congratulate the Board on the absence of any epidemic, and on the general healthfulness of the township.

W. FENTON GRAHAM, M.D.,
Medical Health Officer.

MISSOURI, EAST.

Secretary's Report.

The Board of Health of the Township of East Missouri, beg leave to submit their annual report.

The Board held its first meeting on the 11th February, at which it was resolved to get some large posters printed calling upon the people on or before the 15th May, to clean up their yards, to empty and disinfect their privy-vaults, and to abate all and sundry causes which might tend to disease; and also, requesting all persons who were aware of the existence of nuisances, or removable unsanitary conditions in their several localities, to send written notice thereof to the Secretary of the Board.

These notices having evoked no response and, there being no dangerous cases of sickness reported, the Board has not been called upon to meet.

There have been two or three isolated cases of typhoid fever reported, but in all cases they have been brought in from other localities, and have in no case extended beyond the individual first affected, and have in each case yielded to the remedial measures adopted by those in charge of them.

We are happy to be able to report that the health of our community has been quite satisfactory, and continues to be so at present.

C. R. COMMANDER,
Secretary.

NORMANBY.

Medical Health Officer's Report.

Normanby being favourably situated with regard to its drinking water supply and also its drainage, malarial and zymotic diseases are almost unknown. During the present year we have had an occasional case of typhoid fever, but in nearly all the cases the disease was contracted in other localities.

Diphtheria has also occurred sporadically but not epidemically. It appears to be difficult to completely isolate these cases, as neighbours can hardly be restrained from visiting places where disease exists.

Scarlet fever was almost entirely absent during the year.

Measles have not been troublesome.

The principal business done under the supervision of the Board of Health was an inspection of the sanitary condition of the villages, school premises, wells, butter and cheese factories.

The work of the Board seems to be appreciated by the public.

P. McLEAN, M. D.,
Medical Health Officer.

NOTTAWASAGA.

Secretary's Report.

As Secretary of the Board of Health of this Municipality, I beg to report as follows:—

Since the receipt of your favour of the 19th ult., the Board met and the Chairman reported that the Board had nothing to report except the very healthy condition of the township and its immunity from all contagious or infectious diseases during the whole year.

ANGUS BELL,
Secretary.

ONEIDA.

Chairman's Report.

The work of the Board this year has been very light, and we have had no meeting except the one to-day to submit the report. Each member of the Board took upon himself to attend to any matter in the interests of the public health that he deemed necessary, thus obviating a regular meeting of the Board and saving expense.

The removal of the gentleman appointed as Medical Health Officer, Dr. A. K. Sturgeon, has left us without a report of the sanitary condition of the municipality. We are persuaded, however, that no disease exists that needs the interference of the Board. If any has existed during the year, the persons mentioned in sections 46 and 49 have either, through wilfulness or ignorance, failed to obey the instructions of said sections; and of course nothing was given us to do in that line. The only work of any kind performed during the year was the ordering of certain dead carcasses buried. I have pleasure in stating that the expenses of the year is much less than that of any other year.

MATTHEW SPRATT,
Chairman.

Ops.

Medical Health Officer's Report.

The health of the inhabitants of the Township of Ops continues so exceptionally good that I have nothing of sufficient importance to justify any lengthy report.

During the past year no epidemic or contagious disease, except a few cases of whooping cough, has shown itself, and we may again congratulate ourselves on immunity from this class of disease.

THOMAS W. POOLE, M. D.,
Medical Health Officer.

ORILLIA—NORTH AND SOUTH.

Chairman's Report.

In accordance with statute your Board of Health beg to report that the work of your Board has been very light for the year that is now drawing near to an end. We have had occasion to meet only twice. There has been no communications of nuisances of any sort, with the exception of one dead animal, east of Washago, which was promptly removed at the expense of \$1.00 to your municipality. Your Medical Health Officer made no report to your Board this year, for the reason, I suppose, that he had nothing of any importance to report. Therefore your Board has great pleasure in congratulating you on the good sanitary condition of your municipality. There has been no infectious or contagious diseases that your Board have heard of.

ARCHIBALD THOMSON,
Chairman.

OXFORD, EAST.

Medical Health Officer's Report.

My official work during the year has been very light, as the township has been almost free from contagious diseases. There have been a few cases of typhoid fever, all confined to one family at Oxford Centre, with one death; the remaining members who were attacked are either convalescent or becoming so. There have also been a few cases of diphtheria of a mild type, but no deaths. I would strongly urge the adoption of the suggestion made by the late Dr. Thrall, in his report for 1887, with regard to the introduction of the dry-earth system of the disposal of sewage in our public schools, as there is no doubt that, in many cases, diseases arise from germs emanating from the present water-closets. If the same system were more generally adopted in private houses it would be conducive to the health of the people.

J. McLURG, M.D.,
Medical Health Officer.

OXFORD, NORTH.

Secretary's Report.

The Local Board of Health for the township of North Oxford beg to report as follows:—In accordance with the provisions of the Public Health Act, the Local Board of Health for this township was organized and held its first meeting on February 4th, 1888. The Sanitary Inspector was instructed to make a tour of the township and post up notices requiring the inhabitants to place their premises in a sanitary condition, on or before the 15th of May. He was also instructed to visit all cheese-factories and slaughter-houses not less than three times during the year. There is now only one slaughter-house in use in this township, of which there was some complaints during the warm season of the year. The Inspector was directed to make frequent visits to the premises and see that they were kept thoroughly clean, and the offal removed within twelve hours after each killing, and not to allow hogs to be kept on the premises for the purpose of feeding the offal to. There has been no complaint of the cheese-factories or any other places in the township, and so far as our information extends of the sanitary condition of the township there is no reason to complain. The fertilizing works of the Ingersoll pork factory in this township has been closed all season.

There have been a few cases of diphtheria, typhoid, whooping cough, and one case of scarlatina, in all of which proper precautions were taken to prevent their spread.

ABRAHAM HILLSDON,
Secretary.

 OXFORD, WEST.
Medical Health Officer's Report.

I have the honour to report that, with the exception of an epidemic of measles, the township of West Oxford has been fairly exempt from contagious diseases. The record shows a slight increase in the number of cases of malarial fever over last year, but of a mild type, with two cases of typhoid and one of diphtheria.

The only characteristic of the epidemic of measles worthy of mention was its extreme contagiousness, old and young becoming victims after the usual period of exposure and incubation. Out of 116 cases there was one death from acute phthisis, developed as a sequela.

I would recommend that means be taken to make the people better acquainted with sanitary laws, both advisory and mandatory, by the publication on slips or tracts for easy distribution of portions of such law as relates to the conditions usually surrounding dwellings in the country and villages.

I believe ignorance of these conditions and of the importance of avoiding or remedying them, and of the use of simple disinfectants, is very general and requires that measures should be adopted to give a better knowledge of the points here indicated. I would further recommend the following changes to increase the efficiency of the Board of Health, viz: Stated times of meetings of the Board, more thorough inspection, and a salaried Medical Health Officer.

J. D. BROWN, M.D.,
Medical Health Officer.

 PELHAM.
Secretary's Report.

Acting under resolution passed by the Board, the chairman-elect and secretary inserted notices in the local papers "Urging upon all physicians practising in the township, and all public school teachers engaged therein, as well as all parents and heads of families owning or occupying premises in the township, the pressing necessity of a strict observance and enforcement of the public health by-laws and sanitary regulations in force therein." Also, requesting "physicians and teachers to report to the officers of the Board with the utmost promptness every case of infectious or contagious disease, and to be particular that in every case cards of warning are posted up as required by law." Also, "urging persons who may be annoyed by the existence of putrid and decaying animal or vegetable matter to report existence of same to Board."

The secretary's memorandum book has the following entries of matters reported to him:—

One public school teacher reported a case of measles or scarlatina having occurred in the school. The child was kept at home till she recovered. The existence of dead animals unburied was complained of in three different parts of the township, and the Sanitary Inspector got them buried in each case by the owners. In one instance there were fourteen carcasses on one farm. As in former years Dr. Birdsall was about the only physician who took the trouble to report infectious diseases. His report included two cases of scarlet fever and three of diphtheria among children. No report as to death or recovery of these patients. The only other case reported was by Dr. Emmett—a scarlet fever case. The dwelling was placarded by the Sanitary Inspector who acted under instructions from the Medical Health Officer. This is the only case reported where card of warning was put up. I am personally cognizant of three or four cases of typhoid fever, but none of them were reported by the physicians in attendance.

J. C. CROW,
Secretary.

PERCY.

Medical Health Officer's Report.

I have to report seven cases of diphtheria and two cases of typhoid fever occurring in the township of Percy in the year 1888. The diphtheria cases were of a most malignant type, but by prompt isolation the disease was confined to the houses in which the first cases occurred. Outside of these cases of infectious diseases the sanitary condition of the township has been good in every respect.

J. M. CLEMENSON, M.D.,
Medical Health Officer.

PICKERING.

Secretary's Report.

The Local Board of Health for the municipality of the township of Pickering beg to present their annual report as follows:—

We are pleased to say that although the number of cases of infectious diseases occurring in the municipality during the present year has been large, yet the number of deaths resulting therefrom has been small.

There have been thirty-two cases of diphtheria reported to the Board, of which four resulted fatally. Of scarlet fever nine cases were reported; none resulted fatally. Twelve cases of typhoid fever were reported and known to exist, in all of which cases the patients recovered. The Board feel pleased to be able to report that the rate of mortality has been very low. This result we attribute very much to the vigilance of our inspectors.

Our inspectors were called upon on three several occasions to visit localities where horses and cattle had died or been killed. In two of these instances the animals had been killed by trains on the Grand Trunk and Canadian Pacific Railways respectively, and the calls in all instances were made to have the animals buried.

DONALD K. BEATON,
Secretary.

PROTON.

Chairman's Report.

It is with pleasure that I inform you that the general health of our people has been good during the year. With one exception there has been no case of infectious or contagious disease brought to our notice. In this one case a family developed symptoms of malarial typhoid on the return of a daughter who came home ill from Caledon township. Several of the family were prostrated with the disease, and one female died. Dr. McWilliams attended the family and reported a mild form of typhoid with little danger of spreading. He looked after the requisite sanitary precautions. No new cases have appeared in the vicinity.

In first week of July we visited and examined the three cheese factories in operation and found all in a creditable state, with suitable fittings and the premises clean and suitable for the manufacture of good, wholesome cheese.

Each member of our Board having had supervision of a township division has earnestly striven to impress upon the people the necessity of having all premises, schools, etc., and the water for drinking purposes as pure as possible. Our people are gradually coming to understand and act in conjunction with the Board for the general health of the township.

SAMUEL ROGERS,
Chairman.

PUSLINCH.

Sanitary Inspector's Report.

I am happy in being able to state that the general health and sanitary conditions of this township are good. Diphtheria was somewhat prevalent in the month of December, 1887, and the early part of this year. Three cases were fatal. The disease was, in the first place, imported from Galt. The usual precautions were taken to prevent its spread. An epidemic of measles swept over the village of Morriston and vicinity in August and September. The school was closed for a time. No deaths occurred.

During the present year inspections were made in May and October of all villages, slaughter-houses and school properties, including wells and water-closets in connection with the latter. I was pleased to see that, with a few exceptions, our people had their premises well cleaned and, as far as I could see, in a good sanitary condition. All our school sections are likewise in a good condition. Slaughter-houses have been inspected at intervals and found to be generally satisfactory.

Early in May I visited all parties in this municipality known to be engaged in the sale of milk, inspected their cow-stables or byers, and made enquiries as to kinds of food, quality of water, etc.

ANDREW MUNRO,
Sanitary Inspector.

RALEIGH.

Medical Health Officer's Report.

In presenting to you my annual report as Medical Health Officer for the the township for the year 1888, I have to congratulate you on the sanitary condition of the municipality. During the present year your township has not been visited by any widespread cause of mortality.

In diseases of an infectious nature there has been quite a number of cases of measles, whooping cough, etc., but the rate of mortality has been very small; there have also been a few cases of diphtheria and typhoid fever, and in all cases the houses were properly placarded.

Several complaints were made about the unsanitary condition of the slaughter-house kept by Peter Cramb, in the village of Buckhorn. In company with a member of your Board I visited this slaughter-house and found it in an unsatisfactory condition; the slaughter-house and butcher shop were in one building, only a slight partition separating them. The slaughter-house was not kept in a fit condition by any means. In the yard adjoining the slaughter-house, right in the middle of the village, were a number of pigs kept, and the entrails were fed to them. In the yard was a large heap of heads, bones, etc., emitting a fearful stench; here also the refuse material was boiled and rendered. All this was going on within twelve feet of some of the neighbours' houses. I at once ordered the removal of the slaughter-house and the yard and buildings thoroughly cleaned up, which was done forthwith. I also had to order the removal of several pig-styes throughout the township, such being in too close proximity to the dwelling houses.

JOHN CHARLES BELL, M.D.,
Medical Health Officer

REACH.

Secretary's Report.

I have very much pleasure in being able to report that the sanitary condition of this municipality is extra good, and I attribute this in a great measure to the action of the Board of Health a few years ago, they having procured several hundred copies of the

by-law and had one copy left by the assessor at every house and the provisions of said by-law explained to the inhabitants. With a very few exceptions a hearty co-operation of parties interested in complying with the wishes of the Local Board of Health was given. The result is that our municipality is free from any infectious disease this year. There have only been a few cases of typhoid fever reported during the year, and in every case proper provisions were made by the Board to keep it from spreading.

WILLIAM SPENCE,
Secretary.

ROCHESTER.

Chairman's Report.

The Board has not experienced the least trouble in carrying out the provisions of the Public Health Act, as the residents of this township have at all times shown a cordial disposition to carry out whatever orders or suggestions the Board or the Medical Health Officer were called upon to make. The sanitary condition of the township and the health of the inhabitants are in a very good condition.

Diphtheria has broken out three times, but owing to the manner in which the cases were watched by our Medical Health Officer and the houses placarded, the disease was strictly confined to three houses; there were two deaths.

Later on our Medical Health Officer accidentally discovered a case of typhoid fever, and reported that two physicians had attended the patients, but, notwithstanding the strictness of the Act, failed to report the case. The patient recovered, and our Medical Health Officer attended to the proper disinfection of the house and the disease was checked there. The sentiments of the people are to assist the Board in anything regarding the welfare of the public health, but we regret to have to state that some of the physicians practising in our municipality often neglect their duty and should be prosecuted for their neglect, under the Act.

ANDRÉE DUROCHER,
Chairman.

RYDE.

Secretary's Report.

On behalf of the Local Board of Health for the Township of Ryde, District of Muskoka, I beg to report:—That the respective members of the Board were duly appointed by the Council. The first six months of the year passed without any need of action owing to the perfect freedom from disease which the Township enjoyed, but unfortunately the last six months have not been so. In July diphtheria broke out in two families, and before the Board were fully prepared to meet it, it had spread to three other families, all of whom were connected by marriage. At the request of the Board the Council immediately appointed a Sanitary Inspector, with whom alone communication was held with the houses containing the disease and the general public, thus shutting off any danger of infection to others. The result of this outbreak was the death of eight children. In September our Medical Officer inspected all the persons having had the disease, the premises where it had been, and gave us a clean bill of health. Early in October the disease again broke out in one family living in the vicinity of those who had suffered before, and the Board again caused the regulations to be put in force more rigidly than before, with the result that though there were three deaths in that family, it was confined to the one house. That house was stripped internally and most thoroughly disinfected. I am happy to say that there has been no return of the disease, and we are hoping that we have once

again returned to our usual healthy condition. With this exception the health of the Township has been good, other deaths that have occurred having been from old age and infantile diseases.

J. G. TAYLOR,
Secretary.

SANDWICH, EAST.

Medical Health Officer's Report.

I beg leave to submit the following report of the sanitary condition of the Township for the year:—During the year thirteen cases of diphtheria and fourteen cases of scarlet fever occurred. Measles also of a severe type prevailed. In other respects the sanitary condition of the Township has been good, and is excellent at the present time. With regard to public vaccination, I would suggest putting off the affair until next spring, there being at the present time no epidemic in this vicinity, and consequently no urgent necessity exists for carrying out the orders of the Provincial Board. In all cases of contagious diseases the requirements of the law have been fulfilled to the letter—isolation and disinfection.

H. R. CASGRAIN, M.D.,
Medical Health Officer.

SARAWAK.

Chairman's Report.

The Board regret to state that typhoid fever has been prevalent most of the summer, no less than fifteen cases in and around Brooke Village having been reported by your Inspector. There have been two deaths. No report having been made by the doctors attending, your Board cannot say with certainty whether all these cases were typhoid or not. With the exception of the above, the sanitary condition of the Township has been fairly good. The Board, as usual, has had trouble with the slaughter-houses, but steps were taken and means used to put a stop to the nuisance. The proprietors were summoned to appear before a Magisterial Court to hear and answer complaints laid against them. The matter was settled by mutual agreement, the proprietors paying expenses incurred. Since then no complaints have been made.

The Board has had three meetings this year, mainly in connection with the slaughter-houses. Your Inspector has been diligent in the discharge of his duties.

I have pleasure in stating that your Medical Health Officer, Dr. O. E. Barnhart, continues as usual indefatigable and attentive in discharge of the duties devolving on him.

A practice exists which is very prevalent and injurious to public health—no doubt kindly intended—of persons crowding into a house where sickness occurs. Much caution should be used in this matter, not only in regard to the person affected, but in view of the great danger of contagious diseases being spread in the community.

Your Board urge on School Trustees the absolute necessity of keeping school privies in a perfect sanitary condition; on inspection some of them were found to be in a most disgraceful state.

WILLIAM ROY,
Chairman.

SARNIA.

Medical Health Officer's Report.

I have the honour to submit my report for the year 1888:—

There has been comparatively little sickness of any kind in the Township and great freedom from infectious disease during the year. In the month of November scarlet fever

made its appearance in a family at Cole's Corners, on the second concession, and, I regret to report, proved fatal in one case. I have not yet been able to trace the contagion to its source, but by strict quarantine and thorough disinfection the disease was confined to the family where it first appeared.

I casually learned that two or more mild cases of diphtheria existed in School Section No. 5 in the month of November, but were not reported to the Board of Health, an omission or neglect which I trust shall not again occur under similar circumstances in the township.

On the appearance of a number of cases of smallpox in the Town of Sarnia vaccination was largely resorted to by the inhabitants of the township, and section 15 of the Act respecting vaccination was proclaimed in force by the Reeve, as urged by the Provincial Board of Health, with a degree of success as shown by the detailed statement which I have already furnished to the Local Board of Health.

I would urge respectfully upon the Trustees of the different School Sections in the township to continuously require that all children before being permitted to attend the schools shall produce satisfactory evidence of successful vaccination, as well for the protection of the public as to draw the attention of parents to the importance of the subject.

The practice of hauling refuse from the Town of Sarnia and depositing it in open spaces referred to in my last report has not yet been altogether discontinued. No complaints have reached me during the year regarding the slaughter-houses or the fisheries on the River St. Clair, referred to also in my last report. I therefore infer that the unpleasantness formerly complained of has been abated, due I believe to the efficient oversight of the Sanitary Inspector, Mr. Copland.

The dairymen and vendors of milk have taken out their licenses, and are willing to comply with the very reasonable conditions imposed therein by the Board of Health.

A. MACLEAN, M.D.,
Medical Health Officer.

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SCOTT.

Medical Health Officer's Report.

While bringing to your notice the work of the past year, I feel in the first place that we may congratulate ourselves that we have kept our skirts clear of the terrible disease of smallpox which has been almost in our midst, and I feel certain that this has been due to the careful vigilance exercised by your Board. Had the township been without the Board of Health, as in past years, no doubt we would have suffered greatly from the scourge. I might say in this connection that public opinion in this township has changed very much in its attitude towards your Board. As an illustration: Two years ago when vaccination was urged upon them, many of the people looked upon it as a needless expense. This year, however, the same people who so strongly opposed it then have been wishing for such a chance as was given them. Now that the people are beginning to appreciate our work, we may reasonably expect in a short time the health standard to reach a high degree in this township.

I must complain here of the actions of medical men attending cases of contagious diseases in this township not reporting to our Board at once the existence of said diseases. When discovering the nature of the case it would help materially to prevent its spread if the Board had a knowledge of it, but in many cases the Board does not become aware of such disease until it is spreading rapidly. If we knew of first cases we could adopt proper steps to have them scientifically attended to, and thus check them at once. I must urge this matter particularly, and suggest that delinquents be legally proceeded against. We have had sixteen or eighteen cases of typhoid fever this year, and a committee having been appointed to investigate the cause duly reported to your Board. The report was printed and distributed through the township. There have

been no cases of scarlet fever or diphtheria. In conclusion, I trust that the good work which has been begun will be carried out, and the township maintain its high reputation for the good sanitary condition which it has lately enjoyed.

D. CAMPBELL, M.D.,
Medical Health Officer.

SENECA.

Medical Health Officer's Report.

I have the honour to make my final report for the year 1888, and to say that the sanitary condition of this township for the past year has been exceptionally good. There have been no epidemics of any kind, and the rate of mortality has been very low. Thirteen deaths from all causes, old age included, is the number reported to the township registrar up to date. No diphtheria, scarlet fever or measles have been reported; neither has any breach of the Public Health Act been brought to my notice.

ROBT. H. DAVIS, M.D.,
Medical Health Officer.

SOUTHWOLD.

Secretary's Report.

I have the honour to make the fourth annual report, and in doing so beg leave to state that again this municipality has been highly favoured in the last year, only one case of infectious disease having been reported, that of typhoid fever, which the patient contracted while visiting in the town of Sarnia. Cheese-factories, slaughter-houses, school houses and premises were all inspected in the month of May last, and upon the whole were found improved.

Sanitary improvements in slaughter-houses were strictly enforced. There were two complaints made to the Board of existing nuisances, which were speedily removed. The residents of this municipality are much opposed to compulsory vaccination, on account of vaccine used some two years ago having had a bad effect, so much so that some who were vaccinated came near losing their lives. One young man died, and his death was partly laid to bad vaccine. Others had fearful arms that I saw myself, and in many instances about as bad as the real. The sanitary condition of this municipality is steadily advancing; the people are becoming educated in sanitary matters.

M. CAMPBELL,
Secretary.

STAMFORD.

Medical Health Officer's Report.

The past year has been entirely exempt from any epidemic, and has been a most remarkably healthy one, having only had eight cases of diphtheria, which were of a very mild character, and one case of measles.

After the attention of the Board of Health had been drawn to the necessity of issuing licenses, by the Secretary of the Provincial Board of Health, to milk vendors, six being all there were in the township, they were notified of the same. Only one dairyman, however, applied for and received such license.

At a meeting of the Township Council, at the time of the smallpox scare in Buffalo, a public vaccinator was appointed by that body. A proclamation was issued by the reeve; a notice was ordered to appear weekly in the county paper, and posters were scattered through the township to the effect, that "all persons applying therefor would be vaccinated free of charge; those neglecting to do so, or of shewing a certificate of having had it done within seven years, would be liable to the penalties laid down in the Health Act." So far, only about one hundred and forty have been vaccinated. People seem to have a great repugnance to the operation.

I have been informed by the Inspector that the slaughter-houses are kept in as cleanly a condition as possible, and that the cow byres were in a proper state.

Believe the township to be in an excellent sanitary condition in all respects.

JOHN M. DEE, M.D.,
Medical Health Officer.

STEPHEN.

Secretary's Report.

During the forepart of the year there were a few cases of diphtheria, and later on some cases of scarlet fever. Of late there were quite a number of cases of typhoid fever, some terminating fatally. The usual disinfectants were employed by the doctors, and our Sanitary Inspector was directed to visit the locality, which he did, and insisted on his instructions being carried out, which resulted in the disease being arrested in that locality. In one family there were six down with the disease, and although it is very bad around us, this locality has had but comparatively few cases.

Our Medical Health Officer some time ago moved away; we have not appointed another yet.

The doctors have been pretty punctual in giving notice of diseases, and I have attended to putting up cards.

C. PROTTY,
Secretary.

STRONG.

Secretary's Report.

The Board of Health for the township of Strong beg leave to report for 1888 as follows:—At the first meeting in the year Chas. A. Toole, M.D. was appointed Medical Health Officer, and Daniel Grummett Sanitary Inspector. As the population is not very dense, we have been comparatively free from contagious or infectious diseases. One or two cases of typhoid fever have occurred, but every precaution was taken by the Medical Health Officer to confine the disease, and was successful in preventing it spreading. The Sanitary Inspector has been alive to his duties in attending promptly to the removal of anything that might be detrimental to the public health, and altogether the sanitary condition of the township has been and is now very good.

JOHN CARTER,
Secretary.

SULLIVAN.

Medical Health Officer's Report.

I beg to present my first annual report in accordance with the provisions of the Public Health Act of 1884, and in doing so it gives me pleasure to be able to state that during the past year our municipality has been exceptionally free from cases of infectious disease. It is indeed gratifying that, unlike a few years ago when so many deaths occurred from an epidemic of diphtheria in this township, not a single case of this disease has been reported to your Board. Only one case of typhoid fever was reported, and this one happily recovered.

Cases of communicable skin disease amongst the children attending the public schools have been quite numerous, but by isolating those affected and giving them proper treatment, the number of cases are rapidly diminishing. I would respectfully call your attention to the fact that but very few of the children in this municipality have been vaccinated, and as smallpox has lately been in Toronto and vicinity, I would deem it wise to encourage parents to have their children vaccinated, and thus secure comparative immunity from one of the most loathsome of diseases.

GEO. J. DICKISON, M.D.,
Medical Health Officer.

SUNNIDALE.

Chairman's Report.

The Local Board of Health, Medical Health Officer and Sanitary Inspector for this township were duly appointed at the first meeting of the council for 1888.

In making our report we feel thankful in informing your honorable Board that this division has been exempt from any outbreak of dangerous diseases for the past year; no smallpox, diphtheria or typhoid, and the deaths have been of the ordinary class occurring in a very healthy community.

Our Medical Health Officer has no report to make.

WILLIAM SWITZER,
Chairman.

SYDENHAM.

Medical Health Officer's Report.

In presenting to the notice of this Board the sanitary condition of the township for the past year, I would first refer to two cases of diphtheria which occurred last January. One of the cases was near Woodford, and had been ill for some days. On examining his throat during my first visit to him I found considerable tumefaction and membranous deposit, especially over the tonsils and even extending into the nasal cavities. I applied the remedies but the boy died from strangulation two days after. This case could, I think, be traced as coming from similar cases in Galt. The other case was in Annan, but I could not trace its source; this one recovered after considerable trouble. In both cases disinfectants were freely used, and the cases did not spread, although about the same time as the one in Annan, there were several cases of very severe sore throats around there.

The next disease of an epidemic nature coming under our notice was several cases of measles, but being of a mild type required very little treatment; all of them recovered.

In August there came under my care two cases of bilious remittent fever which lingered on for two or three weeks, and both finally recovered without going into the typhoid form.

Those were the last cases worthy of observation, and at present as far as is known to me the township is free from any disease either of an epidemic or endemic nature worthy of consideration.

A. C. SLOANE, M.B.,
Medical Health Officer.

THEDFORD.

Secretary's Report.

During the year the Board has held five meetings. * Our Sanitary Inspector, I believe, has regularly transmitted to the Provincial Board the returns (monthly) of all cases furnished him by our M.D.'s, from which you will see that during the months of February, March and April there were several cases of scarlatina and fever—three of the former fatal, and a few cases of the latter up to November. From June to September a case or two of whooping cough, cholera infantum and diarrhoea, and one case of cholera morbus.

I believe everything statutory has been duly attended to.

During the first half of May some 120 notices were served upon parties here to attend to their wells, privies, manure heaps, etc., which had been reported by our Sanitary Inspector. Subsequently all these places were again inspected and reported as being satisfactory. Recently some new arrivals had commenced digging privy pits too near their dwellings and wells, and have been warned in time to correct their mistakes.

For a year or two the village has suffered to exist a nuisance from the refuse of a cider mill just outside our limits on the north, lying in a mass and fermentation thereby producing a bad smell, which our inspector promptly looked after; otherwise the public school would have had to close.

We are no longer troubled with badly kept slaughter-houses, unburied animals and other former nuisances.

MARTIN WATTSON,
Secretary.

THOROLD.

Medical Health Officer's Report.

In accordance with the provisions of the Ontario Health Act, I beg leave to submit my second annual report for the township of Thorold.

In connection therewith I would beg leave to say that the past year with us has been an eventful one in sanitary matters. The slaughter-houses and other institutions of a similar nature situate in our municipality have received the necessary share of attention, and I am pleased to be able to state that our sanitary condition is excellent.

We had the honor of a visit from Dr. Lehman, who made the request that our Board take immediate steps to have a thorough system of vaccination put in force and carried out.

The matter was duly laid before the Board and action taken thereon. A resolution was passed by the Board requesting the reeve to issue a proclamation declaring the Act relating to compulsory vaccination to be in force; but before the reeve had taken action

*We have not received any disease reports from the Sanitary Inspector. There must be a mistake somewhere. [ED. REPORTS.]

in the matter, the Board again met and rescinded their action of the previous meeting, and referred the question of vaccination to the incoming Board for 1889, when I hope the matter will receive prompt attention, although I regret that action was not taken at once.

H. PARK, M.D.,
Medical Health Officer.

TUCKERSMITH.

Secretary's Report.

The Local Board of Health for the Township of Tuckersmith has the honor to report as follows :

That during the year no information of any nuisance or unsanitary condition within the jurisdiction of this Board of Health has been given, nor any complaint made to any of its members. This Board reports with pleasure the manifestly improved disposition of the people to submit to all necessary regulations, and to assist in establishing better sanitary conditions.

Not a single case of any of the malignant diseases mentioned in section 77 of the Public Health Act, has come to the knowledge of the Board ; and it is believed that not a single case exists or has existed during the year in this division, although some of these diseases visited with considerable virulence some of the neighbouring municipalities.

We do not claim that the happy state of affairs is directly attributable to the labors of this Board, but rather to the good sense of the people who read, and, what is more to the purpose, receive much more than formerly of the doctrines and philosophy of the laws of health. We commend those in authority for their endeavor to keep before the minds of the people the close connection that exists between a people's health and a people's care and cleanliness.

SAMUEL SMILLIE,
Secretary.

TURNBERRY.

Medical Health Officer's Report.

In compliance with "The Public Health Act," I have the honour to submit to you the following report of the Township of Turnberry for the year 1888 :

During that period there has been no epidemic of any infectious or contagious diseases, no cases of any zymotic disease having been reported to me during the year by any of the medical men who practice in the township. I think I may safely say that the rate of mortality has been less than during either of the two preceding years ; and the general sanitary condition of the municipality will compare quite favourably with that of any other rural section of the Province. The only case requiring a special medical inspection was that of an old wooden structure—for years used as an hotel—situated in the town plot of Wingham, in which there were said to have been several cases of typhoid fever. Mr. Lammont, the inspector, and myself visited the premises last February where we found one severe case of typhoid fever. There was every evidence of a great deal of filth and dirt about the place ; a leaking roof and very much rotting vegetable matter in the shape of decaying flooring, sills, etc. Foul smells and contaminated air prevailed in every room. We reported the place totally unfit for habitation. While there is much cause for gratitude that the general health of the township has been so good during the year, yet I am satisfied that very much may be done to improve the sanitary condition of the municipality. There is great danger of disease germs being propagated through care-

lessness in the management of cheese factories, creameries, piggeries and slaughter houses. These establishments need to be closely watched, and nothing but thorough cleanliness and the free use of the most potent disinfectants will secure the best sanitation in such places.

W. B. FOWLER, M.D.,
Medical Health Officer.

USBORNE.

Medical Health Officer's Report.

We have reason to congratulate ourselves that the health of our district has been so good during the past year.

The only epidemic which became at all general was measles. This disease spread from school section to school section and from house to house during the spring months; but, notwithstanding its prevalence, it caused not a single death.

In the event of another outbreak we should be more on guard, and isolate affected families; for contrary to the general public opinion, it is not the harmless disease it is thought to be. It has proved in many cases to be the exciting cause of very serious lung trouble.

Scarlet fever was introduced into our municipality, in the month of September, by a gentleman who had been camping at Grand Bend. It was carried to his sisters and from there to the township of Logan, when unfortunately a child fell a victim to the disease. Had proper sanitary precautions been observed the disease might have been confined to the banks of Lake Huron.

Typhoid fever made its appearance in three houses during the fall months, and in each claimed a victim. One case was brought from a neighbouring municipality contrary to law. We should endeavour to prevent such a recurrence.

We have had no cases of diphtheria this year.

It would be very much in the interests of the public health, if all medical men would comply with the provisions of the Health Act and notify the Medical Health Officer of such cases of contagious and infectious disease as they may be called upon to attend.

The welfare of the community would be greatly advanced if all children in the Public Schools not having a good vaccine mark, were vaccinated at the expense of the municipality.

The Sanitary Inspector performed his work carefully, and from his reports I am led to believe a great improvement has taken place in the condition of the school-houses and their surroundings.

It has been urged by the central authorities (and, I think, with very great reason), that a stricter supervision be kept over slaughter-houses with regard to the cleanliness of such places, the disposal of offal and the slaughtering of diseased cattle.

Hoping that we may still increase our endeavours to promote the health of the community.

W. IRVING, M.D.,
Medical Health Officer.

VAUGHAN.

Medical Health Officer's Report.

The sanitary condition of the township is very good, there having been no epidemics of any kind. Farmers and others have shown much more care in regard to their houses and outbuildings. Some isolated cases of typhoid this fall over most of the township. All the precautions were used to remove cause and prevent spread. At the present time the general health of the township is good.

ROWLAND B. ORR, M.D.,
Medical Health Officer.

WAINFLEET.

Medical Health Officer's Report.

With the exception of whooping-cough in the western part of the district, the township is free of any epidemic disease. The whooping-cough is of a mild nature and as yet unattended by medical skill.

During the past year there have been seven cases of diphtheria, four of scarlatina and three of typhoid fever, but no deaths from the same. In each instance the precautions usually adopted were enforced and the disease confined to those primarily attacked.

This year I met with no unwillingness on the part of the people to having their houses placarded when necessary, and last year less than the year before. They agree that it is desirable and for the public good. A fact that makes the duties of a Medical Health Officer not unpleasant to perform.

On July 31st our Board convened, having been communicated with by the Secretary of the Provincial Board. This was our first meeting since being organized, and the principal subject discussed was the advisability of vaccinating the pupils of the thirteen schools in the township. It was decided to have it done owing to the likelihood of smallpox reaching here. As soon as the schools opened after vacation each one was visited, and every pupil present who did not show marks from vaccination two years ago, was then vaccinated; but strange to say that, although the virus was obtained direct from the Ontario Vaccine Farm at Palmerston and used before it was a week old, a very small percentage of them "took." A large number of them have been revaccinated, but with poor success. Since the weather has become cooler the virus acts more efficiently, and those vaccinated during the last two weeks have nearly all taken.

There has been no sanitary inspection of the township made yet. The members of the Board seem to think they know there is no use of it, as they are around so much and can see nothing wrong. In fact our township is well drained, not over populated and usually very healthy.

W. B. HOPKINS, M.D.,
Medical Health Officer.

WALLACE.

Medical Health Officer's Report.

In compliance with the requirements of the Public Health Act, I beg leave to submit my annual report :

There have not been any cases of contagious or infectious diseases reported to me by any practitioner during the year.

To my own knowledge there was only one case of diphtheria in the township during the year.

The general health of the inhabitants during the year past has been good.

I have pleasure in reporting the absence of nuisances of any kind.

Vaccination has not been performed in any case so far as I am aware, and I would beg leave to draw the attention of the Board to the necessity of a more general attention to regular vaccination, especially in view of the fact of smallpox having prevailed in some localities during the year.

JOHN STANDISH, M.D.,
Medical Health Officer.

WATERLOO.

Sanitary Inspector's Report.

In accordance with instructions received from the Board at the first meeting held this year, I inspected the premises, dairying utensils, stables and cows of all dairymen and milk vendors within this municipality, and I beg to report that I found their premises

all in a good sanitary condition, it being necessary in only one or two instances to make any suggestions where the sanitary condition of the surroundings might be improved. The cows are all well-cared for and fed mostly on farm produce. In a few instances during the winter months brewers' grains were fed along with the ordinary food of the farm. Dairymen who had used the brewers' grains all agreed that they increased the quantity of the milk, but none believed that they improved it in quality.

The cows were all in a thriving, healthy condition and free from tuberculous or any contagious or infectious disease. The methods of keeping, cooling and delivering the milk were all that could be desired. In one instance the cows were fed both summer and winter in the stables, and judging by their appearance and the quantity of milk which they gave, it is the most profitable way of feeding. The owner warms the drinking water for his cows in winter, and feeds only farm produce. All his premises are kept very clean and tidy. I found little or no objection to the means the Board has adopted for making the inspection. I also inspected the various slaughter-houses in the municipality at the same time, and am sorry that I cannot report them all to have been in a sanitary condition at the time I inspected them. Some of them were in a first-class condition, but in others the refuse was allowed to accumulate too long, or the hogs that consumed it were kept too filthy. The owners always cleaned up their premises when requested to do so, but sometimes forgot to keep them clean afterwards.

I have had no complaints of any other premises being in an unsanitary condition, and have had no infectious or contagious diseases to deal with.

WILLIAM COWAN, V.S.,
Inspector.

WAWANOSH, EAST.

Medical Health Officer's Report.

I have the honour to report, as Medical Health Officer for the Township of East Wawanosh, that this township has been singularly exempt from endemic, epidemic or contagious diseases during the past year. That no difficulties have arisen under the administration of the Public Health Act, and that the inhabitants, even as regards the incursions of diseases of a more preventable type, have been highly favoured during the year 1888.

WILLIAM SLOAN, M.D.,
Medical Health Officer.

WELLESLEY.

Medical Health Officer's Report.

In conformity with the Public Health Act of 1884, and amendment thereto, I beg to submit my annual report as follows:—

During the year the Board of Health held four meetings, at each of which business of a more or less important nature was transacted. Though the state of the public health showed no emergency demanding exceptional activity on the part of the Board, there have, from time to time, been questions arising requiring its attention. Several inspections were made, mostly in response to complaints, and in general the injunctions to abate nuisances and correct insanitary conditions were cheerfully complied with; yet I find that, as in other matters of public interest, there are a few so indifferent to the general weal that it would be in the interest of public health to give them an awakening in the shape of prosecution. In my casual rounds I have made it a point to inspect the wells at several school houses, and have found many of them not up to the mark, either as to purity of water or the means of preserving it pure, and I think trustees should be admon-

ished to pay more attention to the subject. The resolution passed at an early meeting this year and reconsidered at a later one, regarding the institution of a general vaccination, has not yet borne fruit for a very sufficient, though not very satisfactory, reason, that the Board has not adequate funds at its command.

Of diseases arising from insanitary conditions, and of contagious or infectious diseases themselves, we have heard comparatively little during the year, though from Linwood and Hawksville a few cases of diphtheria and typho-malarial fever have been reported, in all of which, I am satisfied, due precautionary measures were employed and with satisfactory results. In the main, however, I am pleased to be able to congratulate you on the favourable comparison the present year makes with former years. There is not now any contagious or epidemic disease existent in the jurisdiction of this Board so far as I can ascertain. I cannot close this report without referring in favourable terms to the cheerful compliance of the medical practitioners in observing the rule requiring them to report contagious cases in their practice.

WM. MORTON, M.D.,
Medical Health Officer.

WESTMINSTER.

Chairman's Report.

In presenting the annual report of the Local Board of the Township of Westminster, I beg to state that this township has been very free from epidemic disease during the past year, wonderfully so considering that London South, which is included in this township, has 3,000 inhabitants in a comparatively small space, and is without any regular system of either sewers or waterworks.

This summer we employed an active constable as Deputy Sanitary Inspector, and made a thorough inspection of all the premises in London South, with the object of putting the water closets especially in as good a state as possible, as we had received many complaints concerning them. We feel that it is impossible to provide an efficient remedy as long as a populous neighbourhood use only privy pits for the disposal of all their sewage. But we believe we effected a great improvement, as the people recognized the necessity of the inspection and generally obeyed orders as to the remedies required.

There were more deaths than usual this year, principally from diseases of the respiratory organs in the first quarter of the year. Our township council has willingly paid whatever was required for the expenses of the Board.

J. T. COUGHLIN,
Chairman.

WHITBY, EAST.

Secretary's Report.

The Board has, during the year, investigated all complaints laid before it, but this being a rural municipality containing no large villages, the cases of nuisances claiming inquiry have not been numerous.

While there have been a good many cases of contagious and infectious diseases such as typhoid fever, diphtheria, etc., they have in every instance been of an isolated character and have never approached anything like an epidemic.

We find the people willing to co-operate with the Board whenever cause of action was pointed out to them, compulsion being seldom or ever resorted to. Typhoid fever of a mild type has been more prevalent than formerly.

WM. PURVES,
Secretary.

WHITCHURCH.

Chairman's Report.

We feel thankful that infectious diseases have not made their appearance in the Township of Whitchurch to any extent during the present year.

It is true that we have had isolated cases of typhoid and scarlet fever, and some cases of diphtheria, but on enquiry we learned that every precaution to prevent the spreading of said diseases were taken by those in attendance.

On account of the dreaded disease, smallpox, having made its appearance in the Village of Stouffville and the Township of North Gwillimbury, the Chairman of the Board of Health for the Township of Whitchurch called the Board together on the 2nd day of November, and after due consideration a resolution was passed appointing a committee to take immediate action in case it made its appearance within our limits; and, also, if they considered it advisable, to ask the council to order general vaccination. Our Medical Health Officers have not been required to take any action in their official capacity during the year.

CHAS. J. BRODIE,
Chairman.

WILLIAMSBURGH.

Secretary's Report.

The Local Board of Health of the Township of Williamsburgh in submitting their report for the year 1888 to the Provincial Board of Health, take much pleasure in stating that their duties have been quite nominal. The sanitary condition of the township appears to have been good, and the general health unexceptional. The Board have had no knowledge of the presence of any contagious or infectious disease of a malignant character. There has been no appointment of a Medical Health Officer made, because there did not appear to be any necessity for such appointment.

G. C. TRACY,
Secretary.

WILLOUGHBY.

Chairman's Report.

It is very gratifying to me, as Chairman of your Local Board of Health, to be able to report so favourably on the sanitary condition of the municipality.

In the earlier portion of the year some complaints were made in reference to a slaughter-house in the north-western part of the township, and the Sanitary Inspector was instructed to attend to it, which has been done with beneficial results.

There have been a few cases of diphtheria with one death, but I am pleased to say the sanitary condition of the township has seldom been more satisfactory than at present.

GEORGE WENNER,
Chairman.

WILMOT.

Medical Health Officer's Report.

In submitting to you the annual report on the sanitary condition and health of the township, it affords me much pleasure to be able to state that we have been free from any serious outbreak of contagious or epidemic diseases, and those that have occurred have

been of a mild type. Several cases of typhoid fever have been reported, but no deaths have occurred from it ; and several of diphtheria, with only one death. In the early months of the year we had an epidemic of measles, and a fair estimate must have furnished 100 cases. Out of this large number but one death is reported. Cases of bronchitis among children were reported, although no note was made by the physicians as to whether the measles predisposed to the bronchitis ; it is presumable that such was the case.

It is a matter of much satisfaction to note that the efforts of the Provincial and Local Boards of Health are being appreciated by the community, and that our citizens are becoming impressed with the importance of the sanitary arrangements and care in respect to wells, cisterns and privies, the disposal of garbage and manure heaps, the supervision of slaughter-houses, cheese-factories and schools, the attention to ventilation, heating and drainage in buildings, and to isolation and disinfection in cases of contagious diseases. I have to refer to one practice that is not receiving the attention it should in this township, and which is now recognized as a fruitful source of ill-health, viz., the storing of vegetables and roots in the cellars of dwelling houses, some of which is certain to decay and poison the surrounding atmosphere, which, rising into the living rooms, is breathed by the inmates to their detriment. A better plan, I believe, is to have an out cellar, or brick or concrete building detached from the house for this purpose, and this course is adopted in many parts of the Province.

W. R. NICOLS, M.D.,
Medical Health Officer.

WOOLWICH.

Medical Health Officer's Report.

My duties commenced very early in the year, having been called by the Trustees of School Section No. 3 to examine the school on January the 24th. On the 30th the first meeting of the Board took place at St. Jacobs. On February 7th one of our butcher's premises needed looking after, though the weather was still cold. On May the 7th the second Board of Health meeting was held at Winterbourne, at which I received instructions to issue the annual notices, and to have same posted up at all post-offices and schools. During the summer I visited all the school-houses in the township, and one on the town-line ; several of them had small matters which needed attending to, and at one the water was very bad. I had some trouble with one slaughter-house, and though it looked as if kept in good shape, the smell, even at a long distance, was not pleasant. The last meeting of the Board was at St. Jacobs on October 10th. The Board at this meeting gave permission for the starting of a glue factory in St. Jacobs, and also instructed me to put vaccination notices in five papers published in the county, which was done. Another meeting of the Board came near being held to settle a dispute between two parties as to the position of a stable, but the matter was arranged by the Chairman and Secretary to the satisfaction of both parties. No epidemics this year, and what is not so good, no vaccination. A few cases of diphtheria, and two deaths ; a few of typhoid, and one death. The total deaths in township, thirty-four, which is not seven per thousand of population, is a very good showing. I would suggest that if the Medical Health Officers were allowed to bring in their reports nearer the end of the year they would be more complete.

W. J. PASMORE, M.D.,
Medical Health Officer.

YARMOUTH.

Secretary's Report.

I have the honour to submit the fourth annual report of the Local Board of Health of the township of Yarmouth.

The Board met four times during the year. They enforced regulations for keeping slaughter-houses in proper sanitary condition, and compelled the removal of a large deposit of apple pumice of a cider factory, which was considered unhealthy to the children attending a school adjoining.

No measures have been taken to put the provisions of regulation 8 of the smallpox regulations in force, the Medical Health Officer having no apprehension of danger.

K. W. MCKAY,
Secretary.

YONGE, FRONT OF.

Chairman's Report.

We have had four complaints concerning the accumulation of filth detrimental to the public health. The Board took immediate action and had the same removed. There were six cases of diphtheria, of which five cases were fatal. Seven cases of scarlet fever, one fatal.

We are pleased to report that the sanitary condition of the municipality so far as we know up to the present, is in a good condition.

The Board is also pleased to report that the public are fast learning to appreciate the benefits arising from the vigilance pursued and care taken by the Local Board of Health, and that in a very short time when their duties are more fully known, their efforts will be more fully endorsed.

VINCENT BUELL,
Chairman.

YORK.

Medical Health Officer's Report.

The year has been marked by an absence of epidemic diseases. While neighbouring municipalities have been suffering from the ravages of diphtheria, typhoid fever, scarlet fever and small-pox, we are in a condition to congratulate ourselves upon a comparative immunity from these diseases. To be sure we have had isolated cases of contagious diseases, but not in sufficient numbers to designate them epidemic. What few cases have come under my notice have been easily traceable to their origin. The chief factors in their production have been the abominable privy-pit and the night soil nuisance.

In regard to the former I think such legislation should be demanded as to prevent its future use. It seems impossible to educate our rural population to the dangers of its use, and I am convinced that it will never be abolished without compulsory measures. It is time also we should recognize the danger which lurks in the use of night-soil as a fertilizer. Situated as we are contiguous to a large city where epidemics prevail throughout the year, the danger from this source is one of particular importance to us. The township of York should not allow itself to become a dumping-ground for the disease-laden sewage of the City.

I am sorry in conclusion to be forced to mention what I look upon as a reproach to the medical men in our jurisdiction,—that with one or two exceptions they have neglected to report the cases of contagious diseases which occur in their practices.

H. E. WEBSTER, M.D.,
Medical Health Officer.

YORK.

Secretary's Report.

Your Secretary, in compliance with sec. 24 of the Health Act, 1884, would respectfully report for the year 1888 as follows :—

(1) The Board was duly organized in the month of January ; two Sanitary Inspectors were appointed, one for the eastern and one for the western portion of the township, Young Street being the dividing line ; in the month of April a Medical Health Officer was appointed. During the year the Board held ten meetings, at each of which our Inspectors were present and gave a written or verbal report of the work done by them in their respective districts, and of the sanitary condition of the same.

(2) I am pleased to report that the sanitary condition of the township during the year has been very satisfactory to the Board ; no epidemics or contagious diseases are known to have existed, with the exception of a few isolated cases of diphtheria among children. I would also state that only two cases of malarial fever have been reported or known to the Board during the year.

(3) Our proximity to the City of Toronto has imposed upon our Sanitary Inspectors and the members of the Local Board individually a very large amount of vigilance in order to prevent the transportation of night-soil and garbage into the township from the city, contrary to the rules and conditions of the Board.

(4) The inspecting of slaughter-houses and piggeries has taken up a considerable portion of the time of our Inspectors, but their work has been more pleasant than formerly owing to the fact that the powers vested in the Board are more generally known and recognized, and the residents of the municipality are becoming more alive to the benefits to be derived from the enforcement of sanitary laws, and as a rule meet readily any suggestions or willingly obey any orders which they receive from the Health Officers or members of the Board, for their own benefit and protection and the sanitary welfare of the community.

W. A. CLARKE,
Secretary.

ZONE.

Medical Health Officer's Report.

In making out this my annual report for the township of Zone for the present year, I may say that I think we have great cause to be thankful for the health and prosperity of the township. Since my last report there has been but one case of typhoid fever reported to me during the year, and that terminated favourably. None came under my personal observation ; nither has there been any cases of scarlet fever, diphtheria or other contagious disease reported to me. I think I may safely say that the sanitary condition of the township of Zone is second to no other municipality in the County of Kent.

R. D. SWISHER, M.D.,
Medical Health Officer.

ZORRA, EAST.

Secretary's Report.

In reply to your circular I would state that the Sanitary Inspectors of the municipality have made a thorough examination of the school houses and yards, slaughter-houses and cheese factories, and with but two exceptions found everything in a good sanitary condition. One slaughter-house and one school yard were found not just right, but was, upon notice of Inspector, cleaned up at once. There has only been two cases of typhoid fever within the municipality this year so far. The Medical Health Officer states that he has no further report to make, as he has not been called upon during the year on any occasion.

D. W. McKAY,
Secretary.

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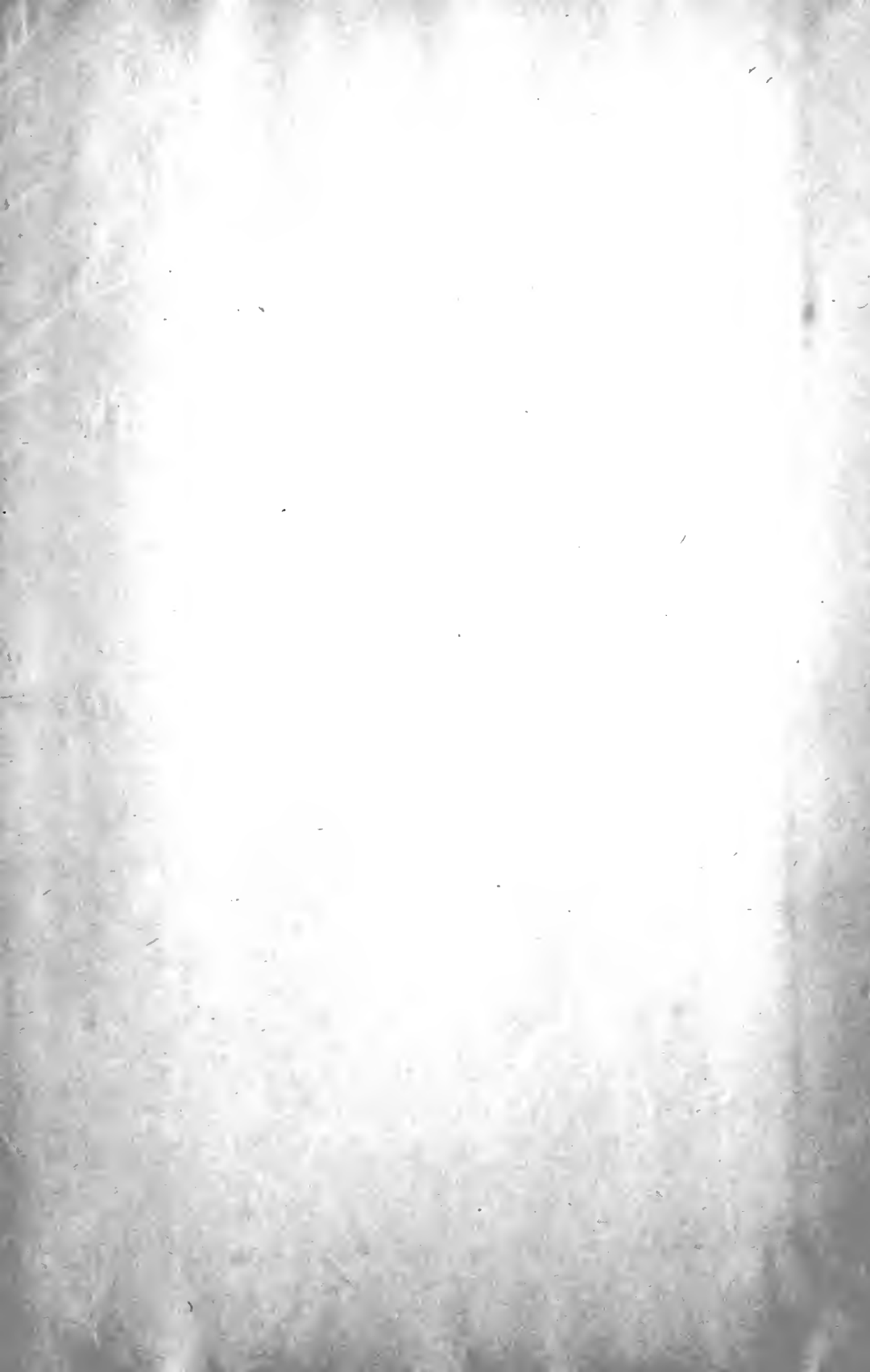
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